REVISIONS

TO

MONTANA DEPARTMENT OF HIGHWAYS

STANDARD DRAWINGS

1984 EDITION

REVISIONS OF:

AUGUST 1, 1985
JULY 1, 1989

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DEPARTMENT OF HIGHWAYS

NOTICE CONCERNING REVISIONS TO THE 1984 EDITION OF THE STANDARD DRAWINGS

The following are new guardrail drawings, together with revised page 4 and a new page 7 of the Table of Contents, to be added to the Standard Drawing Book you now have. These drawings affect those projects let to contract after July 1, 1989.

606-05 Metal Guardrail
606-10 Breakaway Cable Terminal Assembly
606-15 Guardrail Terminal Sections
606-20 Guardrail Terminal Sections
606-25 Bridge Approach Sections
606-26 Tapered Concrete Curb Detail
606-27 Tapered Concrete Curb Detail
606-30 Guardrail Installation for Median Hazards
606-35 Special Hazard Treatments
606-80, 606-82, 606-84, 606-86, 606-88 Guardrail Hardware
606-90, 606-92, 606-94 Guardrail Hardware

The following listed current Standard Drawings will be replaced by the new drawings:

85A Metal Guardrail
85B Metal Median Rail
86 Bridge Approach Sections
87 Pier Treatment
87A Guardrail Installation for Median Hazards
87B Guardrail Installation for Median & Shoulder
88 Guardrail for Grade Crossing Protection
89A Guardrail Terminal Sections
89B End Anchorage

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Users of these Standard Drawings are advised to examine carefully each drawing.

Wayne H. Walters, P.E., Supervisor
Contract Plans Section

WHW:mb:cm:5/j1-2

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Guardrail for Grade Corssing Protection	88	"	
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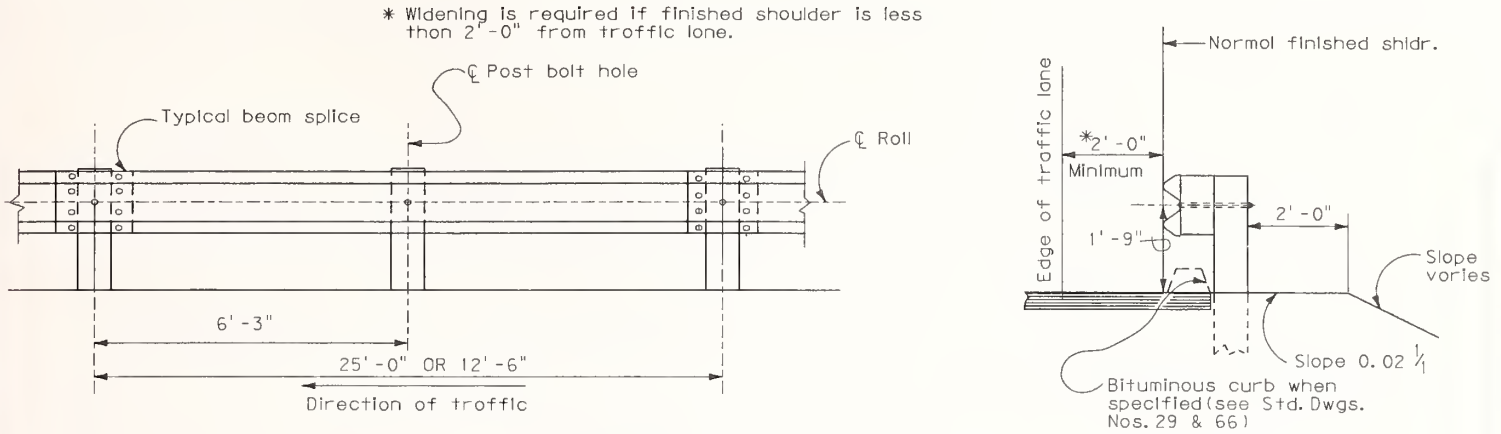
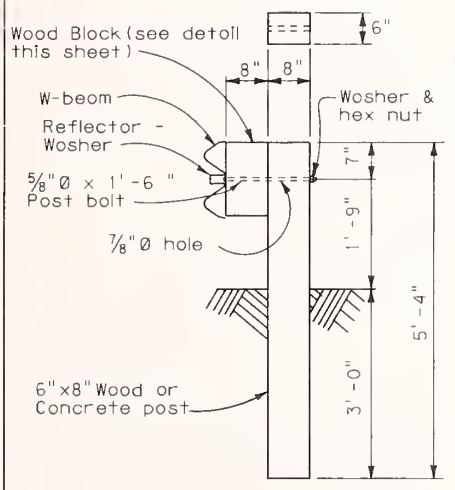
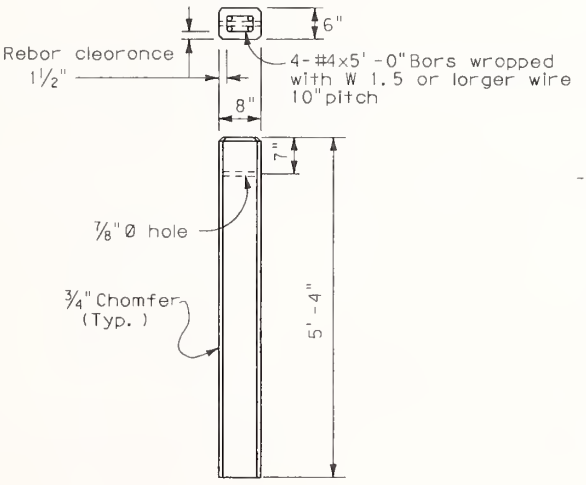
" " "	606-94	7-1-89



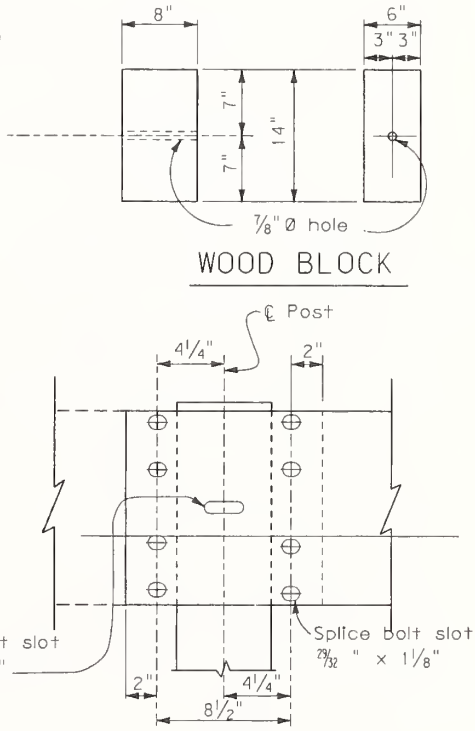
TYPICAL INSTALLATION



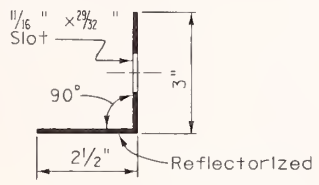


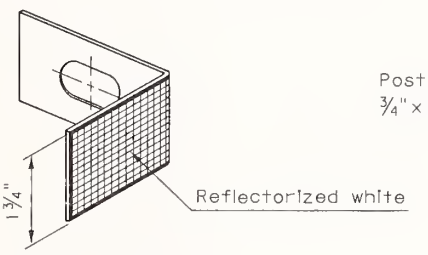
POST AND MOUNTING DETAIL

CONCRETE POST DETAIL



WOOD BLOCK



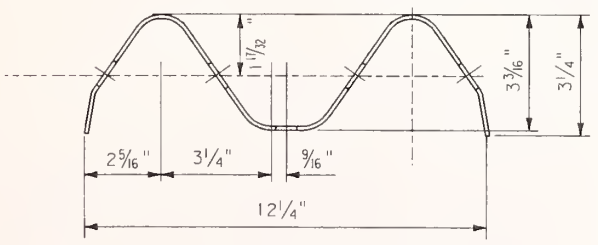


REFLECTOR - WASHER

(See Note 4)

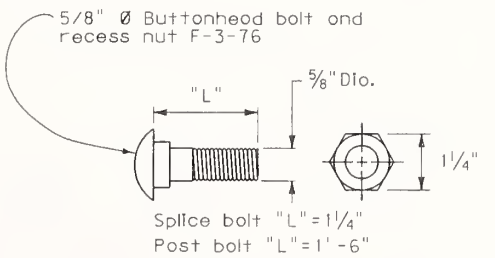
BEAM SPLICE

(Lap in direction of traffic)



W BEAM RE-3-73

(See note 3)



SPLICE & POST BOLT & NUT

(See Note 3)

NOTES

1. BOLTS: All bolts shall be installed with heads on traffic side of installation.
2. BLOCKS: Blocks shall be affixed to posts with construction adhesive or two 16-penny galv. nails or 14 gauge wire wrap.
3. See Standard Drawing 606-80
4. REFLECTOR - WASHERS: Reflector - Washers shall be installed on guardrail face under post bolt heads every 25 feet, with reflectorized surface facing traffic.

MONTANA CADD
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EFFECTIVE	7/1/89		

STANDARD DRAWING

REFERENCE STANDARD SPEC. SECTION 606

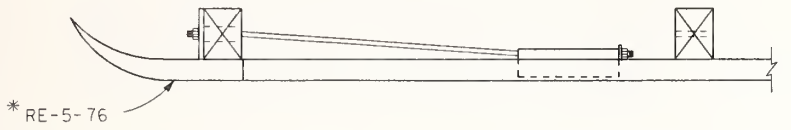
DWG. NO. 606-05

METAL GUARD RAIL

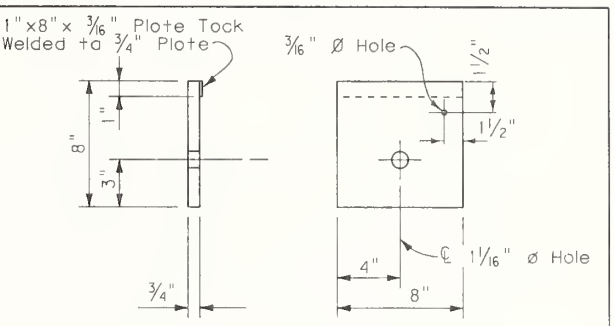
APPROVED

BY Thomas J. Barnard

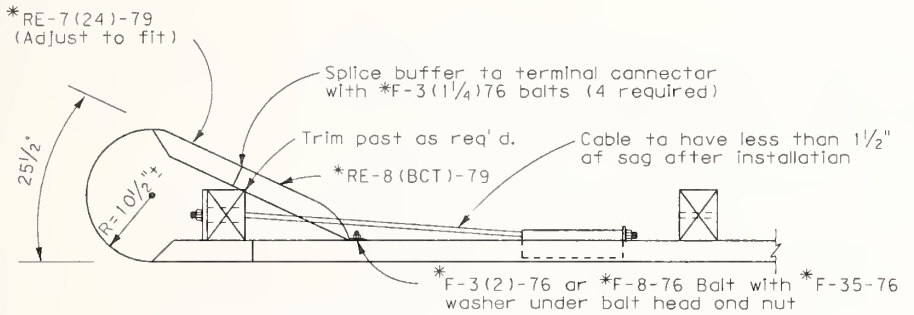
ADMINISTRATOR-ENGINEERING DIVISION



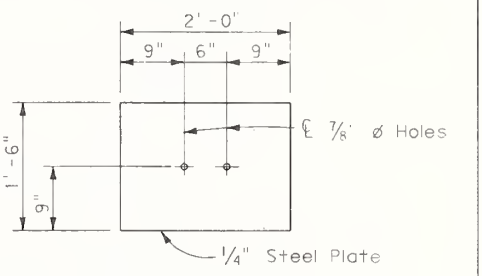
(USE WITH TERMINAL SECTION 2 - SEE STD. DWG. NO. 606-15)



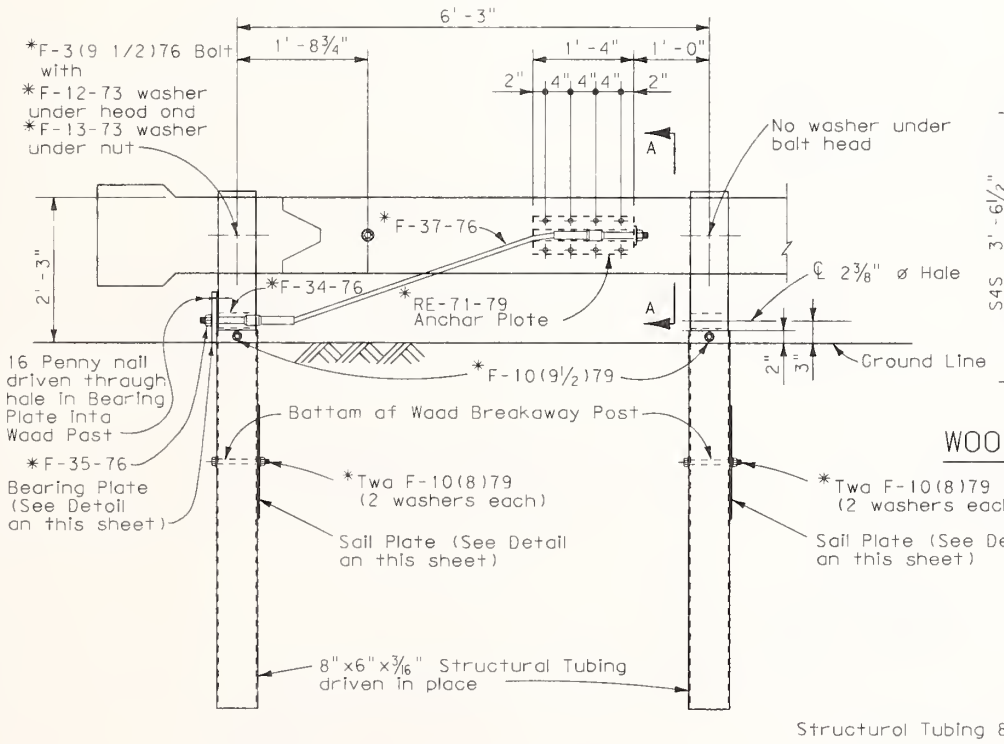
BEARING PLATE DETAIL

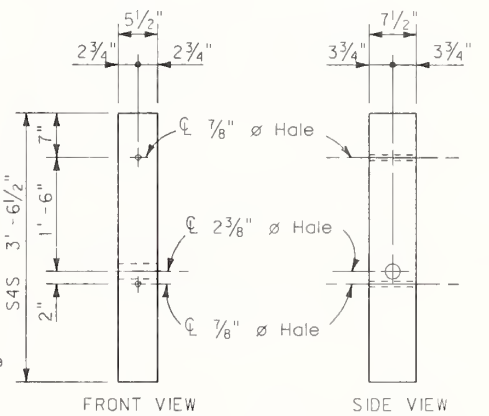

*RE-7(24)-79
(Adjust to fit)
Splice buffer to terminal connectar with *F-3(1 1/4)76 bolts (4 required)
Trim past as req'd.
Cable to have less than 1 1/2" at sag after installation
*RE-8(BCT)-79
25 1/2"
R=10 1/2"
*F-3(2)-76 or *F-8-76 Bolt with *F-35-76 washer under bolt head and nut

(USE WITH TERMINAL SECTION 1 - SEE STD. DWG. NO. 606-15)



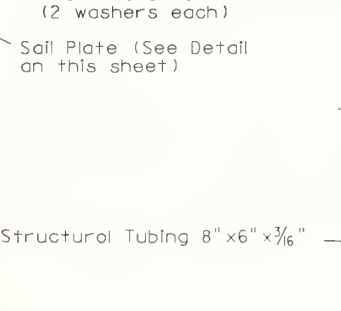
SOIL PLATE DETAIL



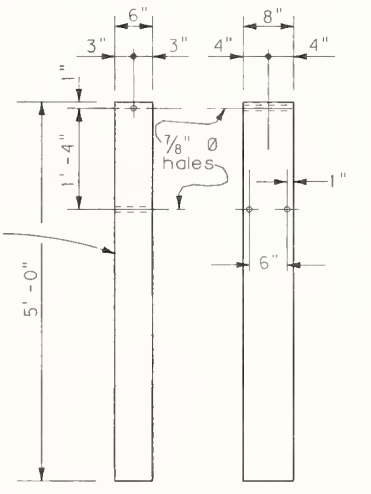


WOOD BREAKAWAY POST DETAILS

BCT DETAILS



SECTION A-A



STEEL TUBE DETAILS

SCHEDULE OF HARDWARE *

DESIGNATION	DESCRIPTION
F-3(1 1/4)76	5/8" x 1 1/4" Buttan Head Bolt & Nut
F-3(2)76	5/8" x 2" Buttan Head Bolt & Nut
F-3-76	5/8" Button Head Bolt & Recess Nut
F-8-76	5/8" x 1 1/2" Hex Bolt & Nut
F-10(8)79	3/4" x 8" Hex Bolt, Nut & Washer
F-10(9 1/2)79	3/4" x 9 1/2" Hex Bolt, Nut & Washer
F-12-73	Rectangular Plate Washer
F-13-73	Washer for 5/8" Bolt
F-34-76	BCT Sleeve
F-35-76	1" Nut & Washer
F-37-76	BCT Cable Assembly
F-38-79	BCT Cable End Plate
RE-3-73	"W" Beam
RE-5-76	"W" Beam End Section (Flared)
RE-7(24)-79	"W" Beam End Section (Buffer)
RE-8(BCT)-79	"W" Beam Terminal Connector
RE-71-79	BCT Anchor Plate

*See Standard Drawing 606-80

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STANDARD DRAWING

REFERENCE STANDARD SPEC. SECTION 606

DWG. NO. 606-10

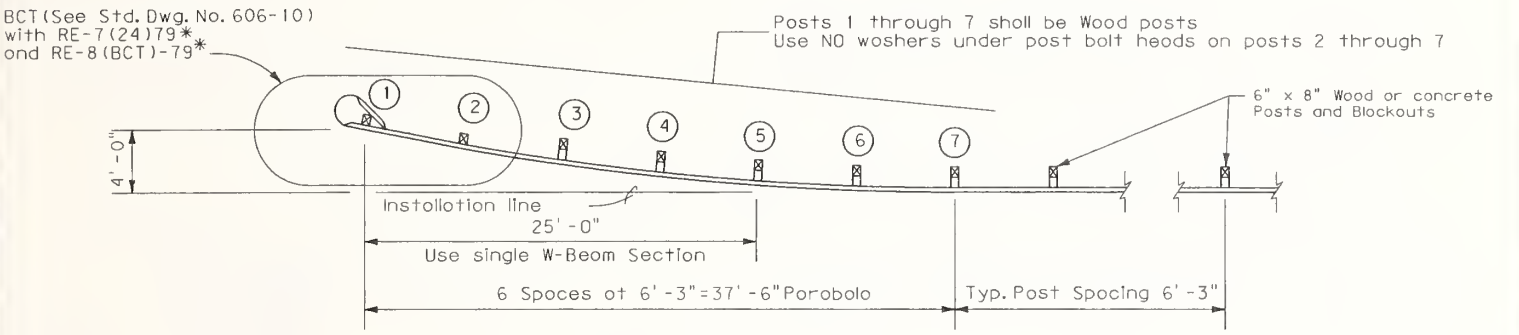
BREAKAWAY CABLE TERMINAL ASSEMBLY (BCT)

APPROVED BY Thomas J. Barnard
ADMINISTRATOR-ENGINEERING DIVISION

PARABOLIC OFFSET DISTANCES:INSTALLATION LINE TO BEAM FACE

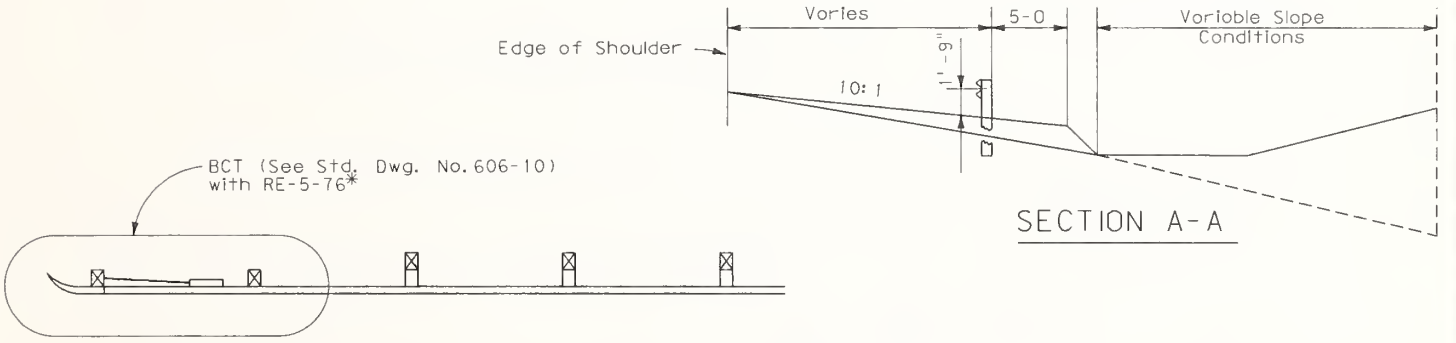
POST NO.	①	②	③	④	⑤	⑥	⑦
OFFSET DISTANCE	4.00'	2.78'	1.78'	1.00'	0.44'	0.11'	0.00'

* SEE STANDARD DRAWING NO. 606-80


BCT(See Std. Dwg. No. 606-10) with RE-7(24)79* and RE-8(BCT)-79*
Posts 1 through 7 sholl be Wood posts
Use NO woshers under post bolt heods on posts 2 through 7
6" x 8" Wood or concrete Posts and Blockouts
4'-0"
Instollotion line
25'-0"
Use single W-Beom Section
6 Spoces ot 6'-3"=37'-6"Porobolo
Typ. Post Spocing 6'-3"

TERMINAL SECTION 1

(TO BE USED ON ALL APPROACH ENDS AND ON ALL TWO LANE, TWO WAY DEPARTURE ENDS)

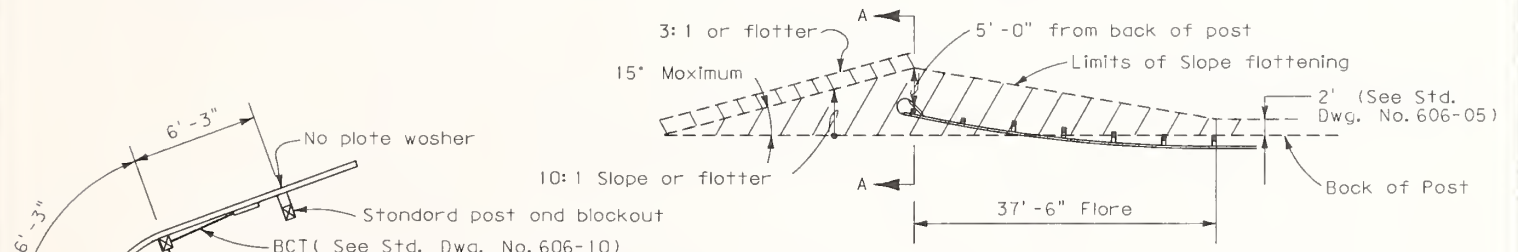


SECTION A-A

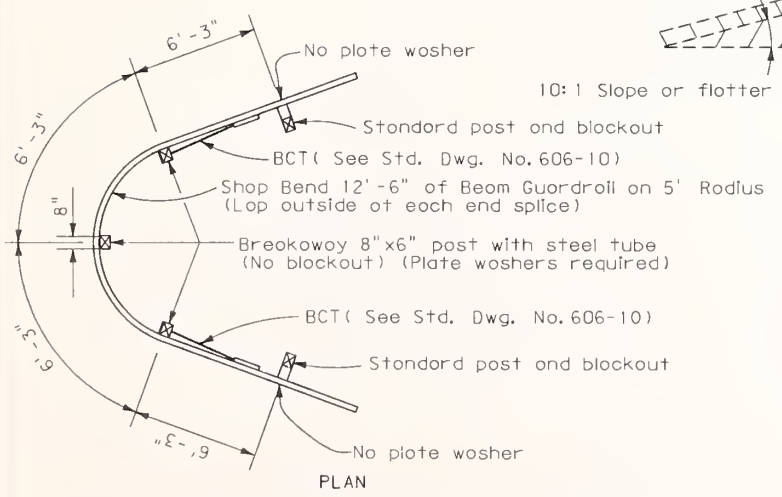
TERMINAL SECTION 2

(TO BE USED ON FOUR-LANE DIVIDED DEPARTURE ENDS)

Flottened slopes sholl meet the density requirements of Stondord Specificotion Subsection 203.05



ROADSIDE SLOPE FLATTENING FOR TERMINAL SECTIONS


6'-3"
6'-3"
6'-3"
6'-3"
8"
No plate washer
Standard post and blockout
BCT(See Std. Dwg. No. 606-10)
Shop Bend 12'-6" of Beam Guardrail on 5' Radius (Lap outside at each end splice)
Breakaway 8"x6" post with steel tube (No blockout) (Plate washers required)
BCT(See Std. Dwg. No. 606-10)
Standard post and blockout
No plate washer

PLAN

GUARDRAIL END ANCHORAGE - 5' RADIUS

STANDARD DRAWING

REFERENCE STANDARD SPEC. SECTION 606

DWG. NO. 606-15

GUARDRAIL TERMINAL SECTIONS

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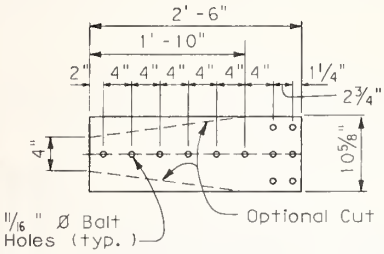
EFFECTIVE	7/1/89		

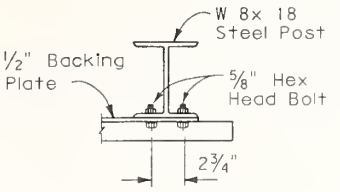
APPROVED

BY Thomas J. Barnard

ADMINISTRATOR, ENGINEERING DIVISION

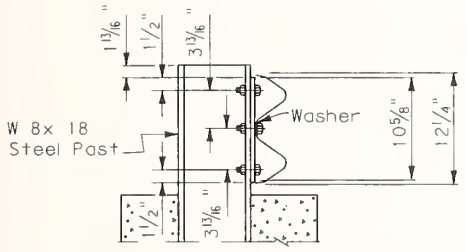


BACKING PLATE

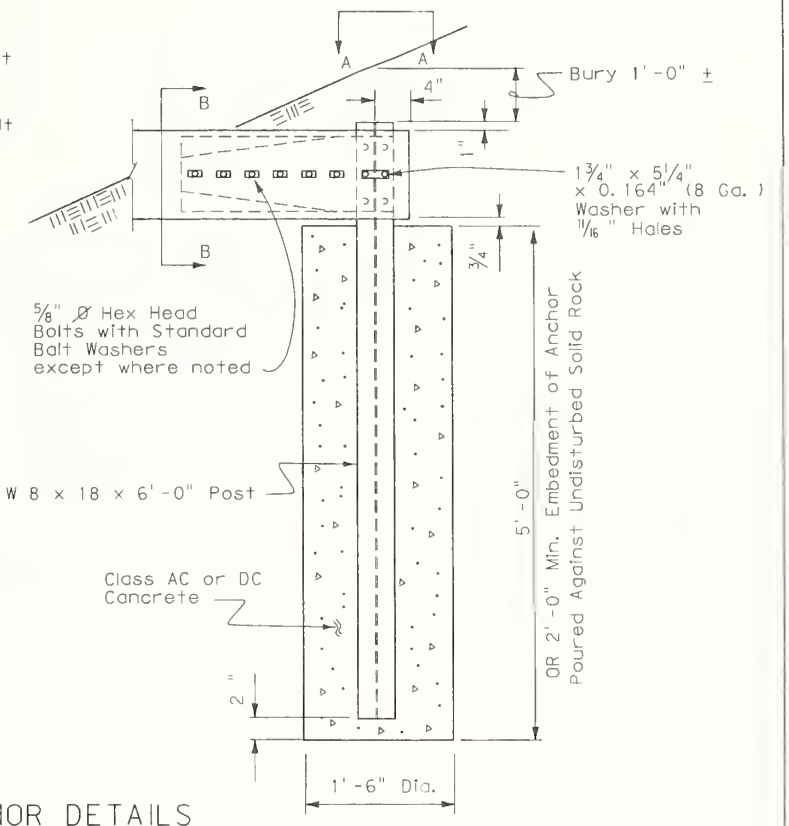


SECTION A-A

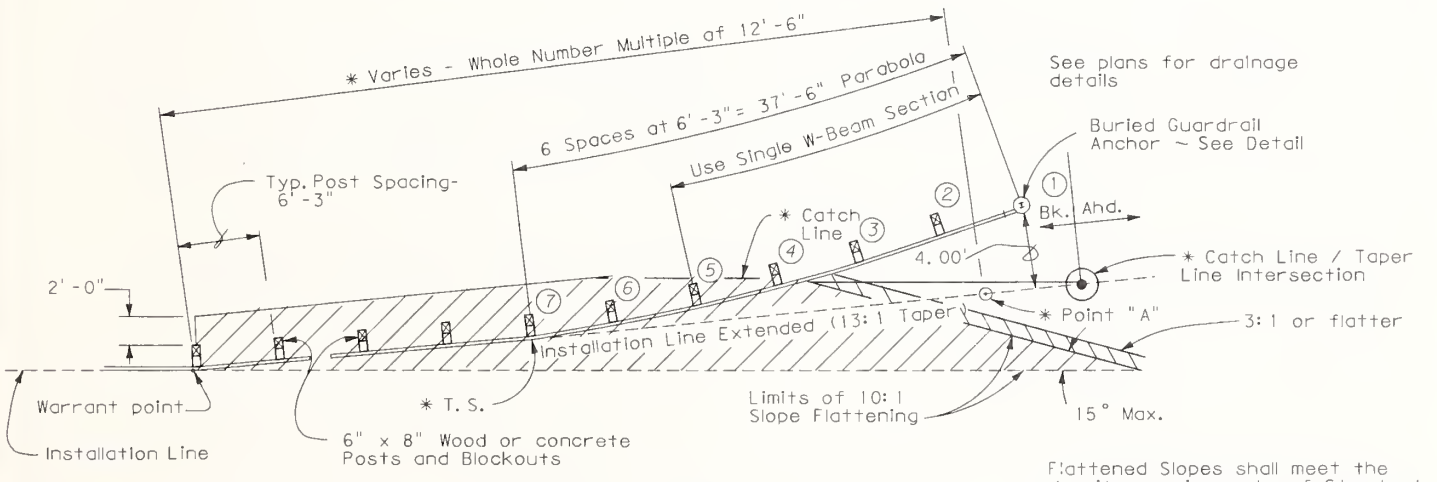
Terminal Rail Section and W 8 x 18 fabricated to receive ⅝" Hex Head Bolts as shown. All bolts shall conform to ASTM A 325.



SECTION B-B



BURIED GUARDRAIL ANCHOR DETAILS



Flattened Slopes shall meet the density requirements of Standard Specifitians Subsection 203.05

TERMINAL SECTION 3

(To Be Used For Cut Slope Embedment)

LAYOUT INSTRUCTIONS *

1. Locate Catch Line. The Catch Line is the line where 10:1 slope flattening catches on the backslope.
2. Extend the 13:1 taper from the warrant point an arbitrary distance beyond the catch line/taper line intersection.
3. Locate Point "A" an the taper line, either ahead af or back of the intersection, at the multiple of 12'-6" nearest the intersection.
4. Determine the backslope rate in the area beyand the intersection.
5. Locate the beginning point (T.S.) of the 37'-6" parabolic arc an the 13:1 taper line in accardance with Table 1.
6. Lay aut the 37'-6" parabalic arc off the 13:1 taper line using parabolic offsets fram Table 2.

TABLE 1 - PARABOLIC ARC BEGINNING POINTS

	Distance Ahead (Ahd.) or Back (Bk) of Point "A" on 13:1 Taper						
Back Slope	1:1	1.5:1	2:1	2.5:1	3:1	3.5:1	4:1
Beginning Paint of Parabalic Arc (T.S.)	25.0' (Bk)	18.75' (Bk)	12.5' (Bk)	0.0'	12.5' (Ahd.)	25.0' (Ahd.)	37.5' (Ahd.)

TABLE 2 - PARABOLIC OFFSET DISTANCES: INSTALLATION LINE TO BEAM FACE

Post No.	①	②	③	④	⑤	⑥	⑦
Offset Distance	4.00'	2.78'	1.78'	1.00'	0.44'	0.11'	0.00'

MONTANA CADD
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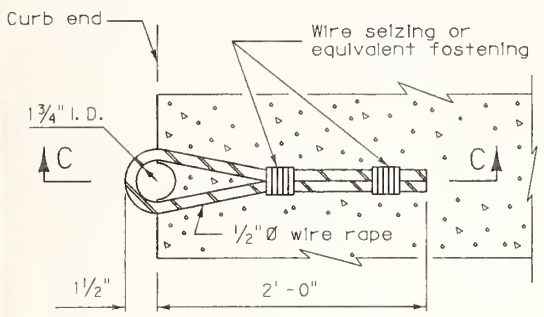
STANDARD DRAWING

REFERENCE STANDARD SPEC. SECTION 606	DWG. NO. 606-20

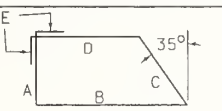
GUARDRAIL TERMINAL SECTIONS

APPROVED
BY Thomas J. Barnard
ADMINISTRATOR-ENGINEERING DIVISION



WIRE ROPE DETAIL

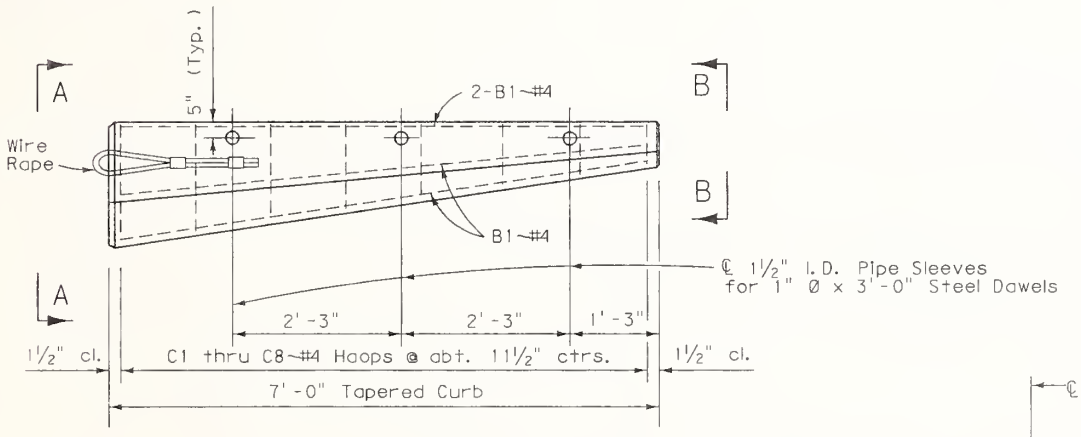
BILL OF REINFORCING STEEL (One section only)



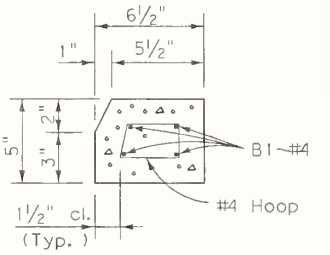
TYPE 1

BENT BARS (All dimensions are out to out)

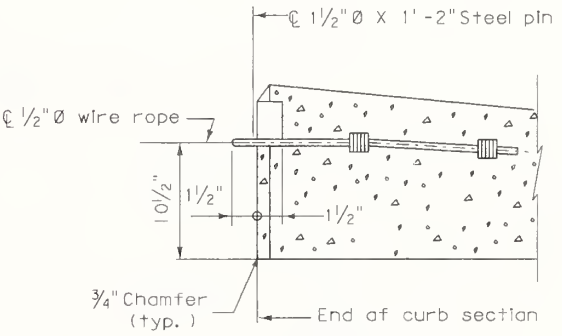
MARK	SIZE	NO.	TYPE	LENGTH	A	B	C	D	E
C 1	# 4	1	1	4'-8"	11"	1'-4"	1'-1"	9"	3½"
C 2				4-2	9½	1-2	11½	8	
C 3				3-9	8½	1-0½	10	7	
C 4				3-3	7	10½	8	6½	
C 5				2-11	6	9	7	6	
C 6				2-4	4	7	5	5	
C 7				2-0	3½	5½	3½	4½	
C 8		1	1	1-6	2"	3½"	2"	3½"	3½"
B 1	# 4	4	str.	6'-9"					



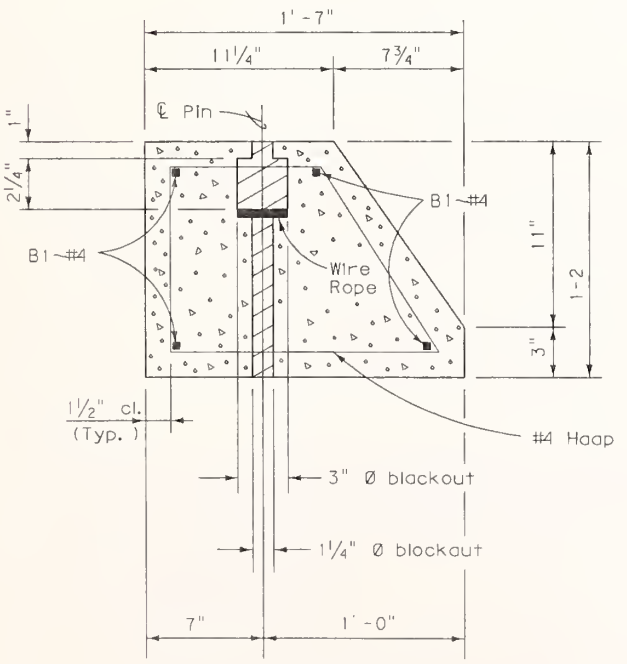
TAPERED CONCRETE CURB-PLAN VIEW



VIEW B-B



SECTION C-C



VIEW A-A

NOTES:

Tapered concrete curb to be used with Bridge Approach section-Type 1 (Std. Dwg. No. 606-25).

Wire rope shall be zinc-coated steel wire 7 strand utility grade with a minimum breaking strength of 25,000 lbs. and shall conform to ASTM A-475.

All reinforcing steel shall be of the deformed type and shall meet the requirements of ASTM A615 grade 40 (AASHTO M-31).

All concrete shall be class "DD".
Total concrete per 7' tapered curb est. = .2 yd^3
Total rebar weight per 7' tapered curb est. = 34 lbs.

STANDARD DRAWING
REFERENCE STANDARD SPEC. SECTION 606
DWG. NO. 606-26

TAPERED CONCRETE CURB DETAIL

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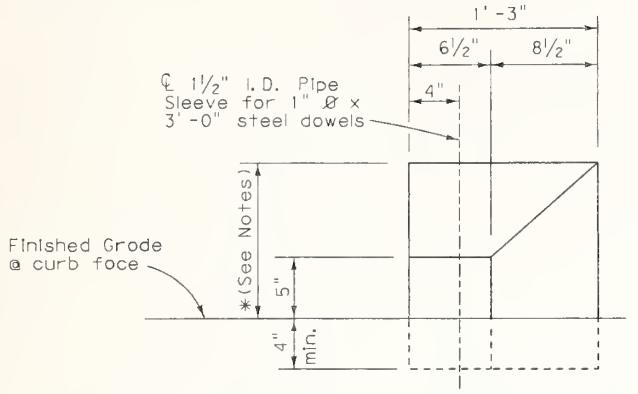
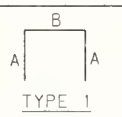


TAPERED CONCRETE CURB-END VIEW

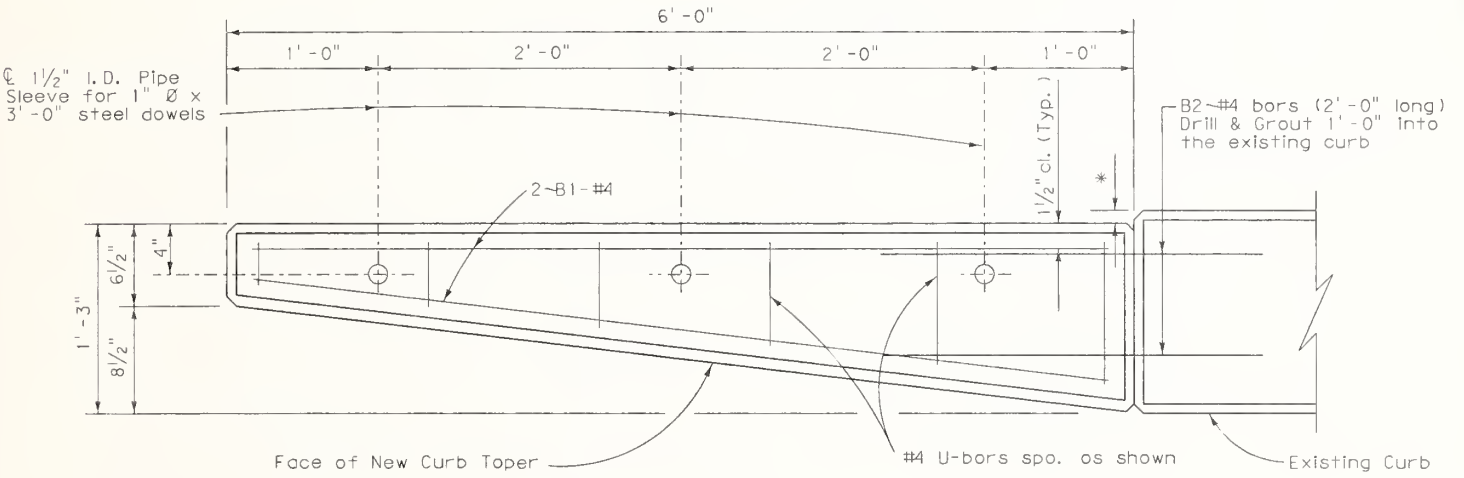
BILL OF REINFORCING STEEL (One section only)



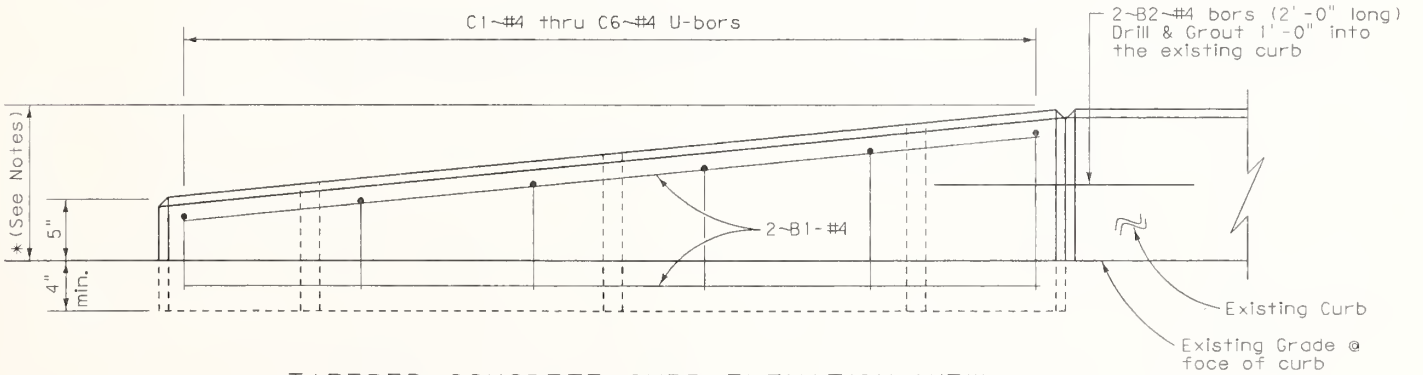
TYPE 1

BENT BARS (All dimensions are out to out)

MARK	SIZE	NO.	TYPE	LENGTH	A	B
C 1	# 4	1	1	1'-4"	0'-6"	0'-4"
C 2	"	"	"	1-8	0-7	0-6
C 3				1-11	0-8	0-7
C 4				2-3	0-9	0-9
C 5				2-6	0-10	0-10
C 6	4	1	1	2-10	0'-11"	1'-0"
B 1	4	4	str.	5-8		
B 2	# 4	2	str.	2'-0"		



TAPERED CONCRETE CURB-PLAN VIEW



TAPERED CONCRETE CURB-ELEVATION VIEW

NOTES:

The existing surface under the new concrete curb tapers shall be removed as approved by the Engineer. The curb toper shall be embedded a minimum of 4" below the grade measured at the inside face of the toper.

All reinforcing steel shall be of the deformed type and shall meet the requirements of ASTM A615 grade 40 (AASHTO M-31).

All concrete shall be class "DD".
Total concrete per 6' tapered curb est. = .2 yd^3
Total rebar weight per 6' tapered curb est. = 27 lbs.

Tapered concrete curb to be used with Bridge Approach section-Type 3 (Std. Dwg. No. 606-25).

* Adjust dimension to match existing curb.

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STANDARD DRAWING

REFERENCE STANDARD SPEC. SECTION 606

DWG. NO. 606-27

TAPERED CONCRETE CURB DETAIL

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SCHEDULE OF HARDWARE *

DESIGNATION	DESCRIPTION	STD. DWG. NO.
F-1-76	15/16 " Hook Bolt	606-82
F-3-76	5/8" Ø Buttonhead Bolt and Nut	606-82
F-8-76	5/8" - 11 Hex Bolt and Nut	606-82
F-10-79	3/4" Ø Hex Bolt, Nut and Washer	606-82
F-12-73	Rectangular Plate Washer	606-84
F-13-73	Steel Washer for 5/8" Ø Bolt	606-84
F-34-76	BCT Sleeve	606-84
F-35-76	Steel Washer for 1" Ø Bolt	606-84
F-37-76	Cable Assembly	606-86
F-38-79	End Plate	606-84
P-1-76	Structural Shape Line Post (Steel)	606-86
P-2-79	End Post Fittings	606-88
P-46-76	Bent Plate Line Post (Steel)	606-90
RE-1-76	3/4" Wire Rope (3 x 7)	606-92
RE-3-73	W Beam	606-94
RE-5-76	W Beam End Section (Flared)	606-94
RE-7(24)-79	W Beam End Section (Buffer)	606-94
RE-8(BCT)-79	W Beam Terminal Connector	606-94
RE-71-79	BCT Anchor Plate	606-90

*See ARTBA Technical Bulletin No. 268-B (AGC Standard Form No. 131) "A Guide to Standardized Highway Barrier Rail Hardware".

STANDARD DRAWING

REFERENCE
STANDARD SPEC.
SECTION 606

DWG. NO.
606-80

GUARDRAIL HARDWARE

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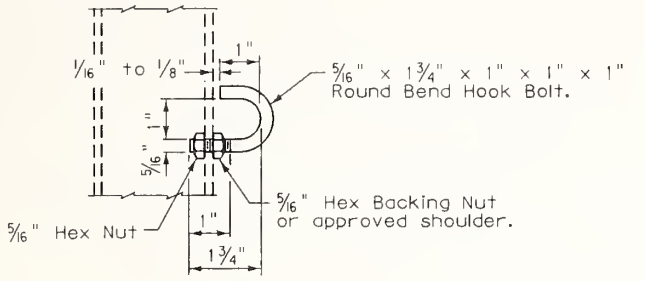
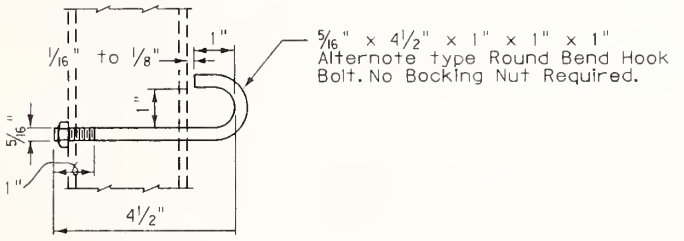
Notes:

Nuts shall be of the Heavy Hex types.

Bolts, as installed, shall develope an ultimate pull open strength of from 500 pounds to 1000 pounds applied in a direction normal to the longitudinal axis of the post.

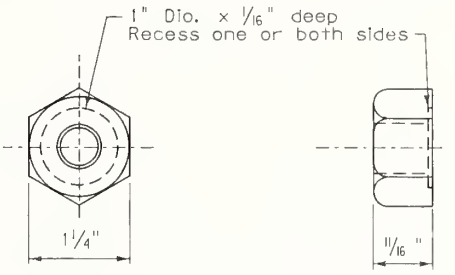


5/16" Ø HOOK BOLT

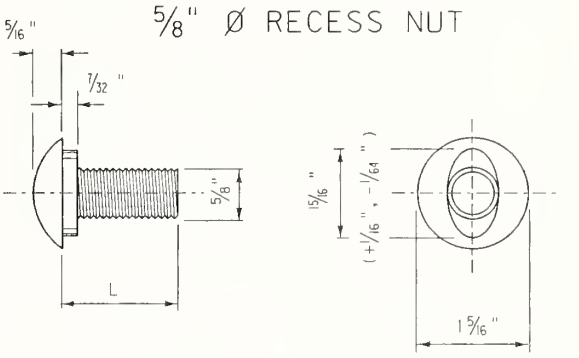


ALTERNATE 5/16" Ø HOOK BOLT

F-1 -76



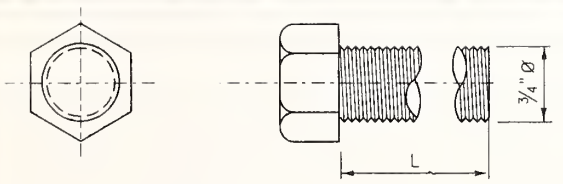
5/8" Ø RECESS NUT



5/8" Ø OVAL SHOULDERED BUTTONHEAD BOLT

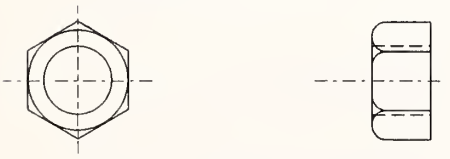
L	Thread Length
1 1/4"	Full length thread
2"	1 1/2" min. thread length
9 1/2"	1 3/4" min. thread length
18"	2 1/2" min. thread length
25"	2" min. thread length

F-3 -76

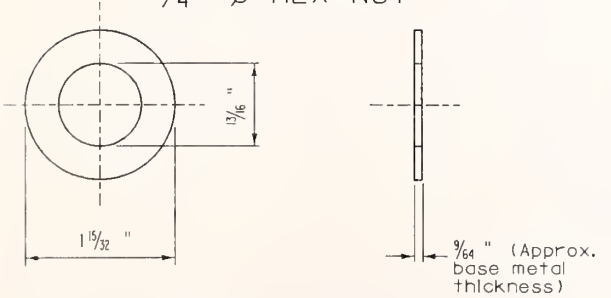


3/4" Ø HEX BOLT

L	Thread Length
1 1/2"	Full
4 1/2"	2"
7 1/2"	2"
9 1/2"	2"

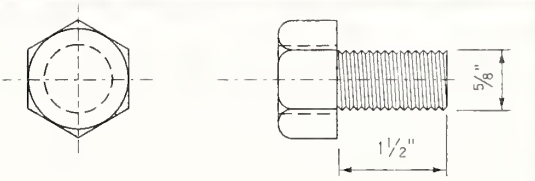


3/4" Ø HEX NUT

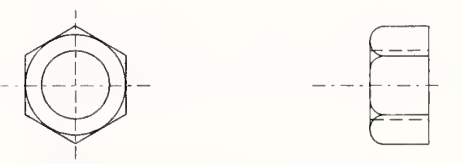


STEEL WASHER FOR 3/4" Ø BOLT

F-10 -79



5/8" - 11 HEX BOLT



5/8" - 11 HEX NUT

F-8 -76

STANDARD DRAWING	
REFERENCE STANDARD SPEC. SECTION 606	DWG. NO. 606-82

GUARDRAIL HARDWARE

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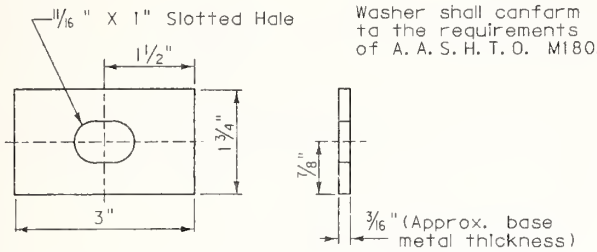
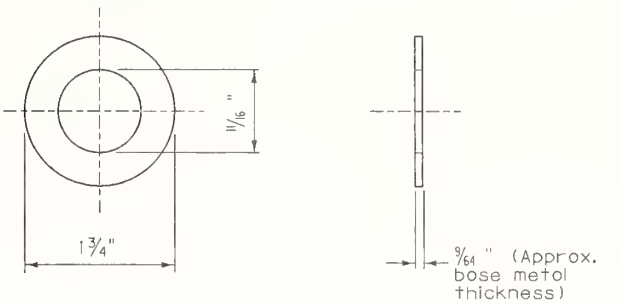


Note:

Washer shall canform ta the requirements of A. A. S. H. T. O. M180.

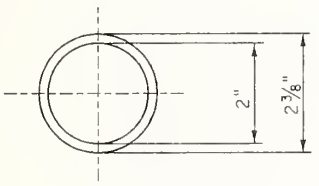
RECTANGULAR PLATE WASHER

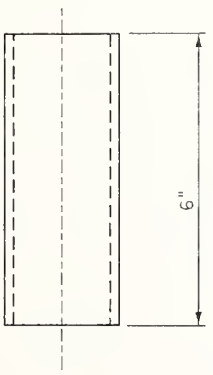
F-12-73



STEEL WASHER FOR 5/8" Ø BOLT

F-13-73



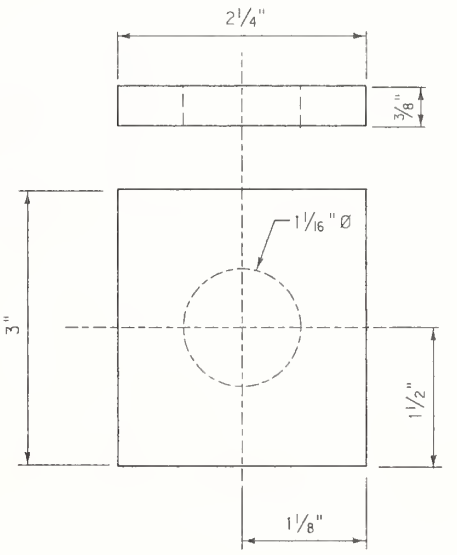


Note:

Sleeve shall conform to the requirements af ASTM A120 ond shall be of 2-Inch galvanized standard pipe.

BCT SLEEVE

F-34-76

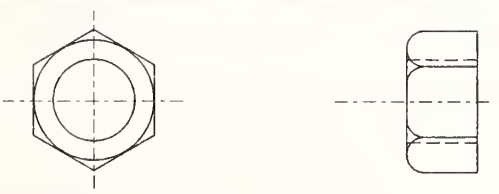


Note:

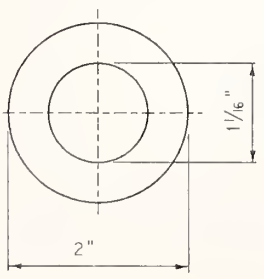
End plates shall conform ta the requirements af ASTM A36 ond shall be galvanized in accordance with ASTM A123.

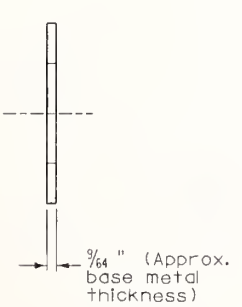
END PLATE

F-38-79



1" Ø HEX NUT





STEEL WASHER FOR 1" Ø BOLT

F-35-76

Note:

Nuts shall canform ta the requirements af ASTM A325 ond washers shall be made af steel; both shall be galvanized in accordonce with ASTM A153. After galvanizing the pitch diameter af the nut may be topped 0.023 inch aver the A. N. S. I. Class 2B taleronce.

Washers shall meet the dimensianal requirements af A. N. S. I. B27.2 Type A Plain Washers. Na punching, drilling ar cutting will be permitted after galvanizing.

STANDARD DRAWING

REFERENCE STANDARD SPEC. SECTION 606

DWG. NO. 606-84

GUARDRAIL HARDWARE

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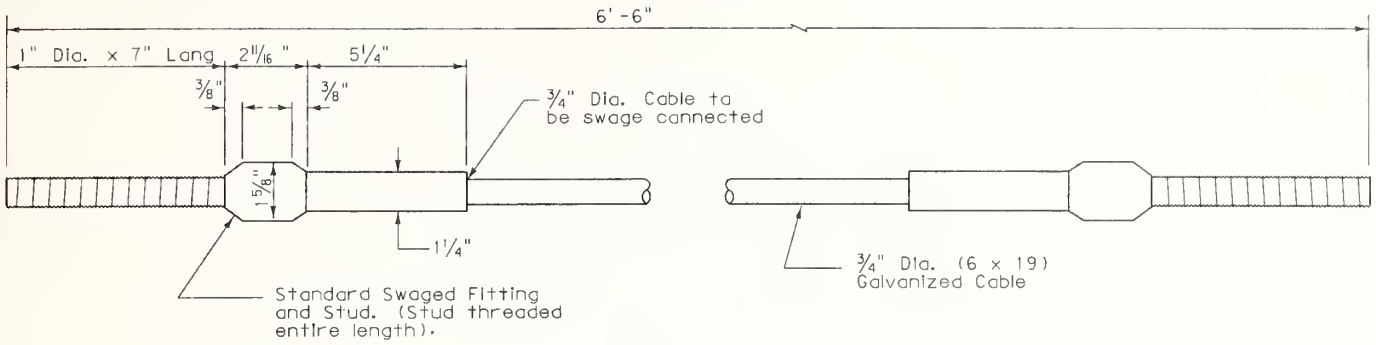


Notes:

For related fastener hardware see F-35-76 and F-38-79.

The swaged fitting shall be machined from hot-rolled carbon steel conforming to the requirements of ASTM A 576, Grade 1035, and shall be annealed suitable for cold swaging. The swaged fitting shall be galvanized in accordance with ASTM A123 before swaging. A lock pin hole to accomadate a 1/4 - inch, plated spring steel pin shall be drilled through the head of the swaged fitting to retain the stud in the proper position. After galvanizing the head may be tapped 0.023 - inch over the A.N.S.I. Class 2B tolerance.

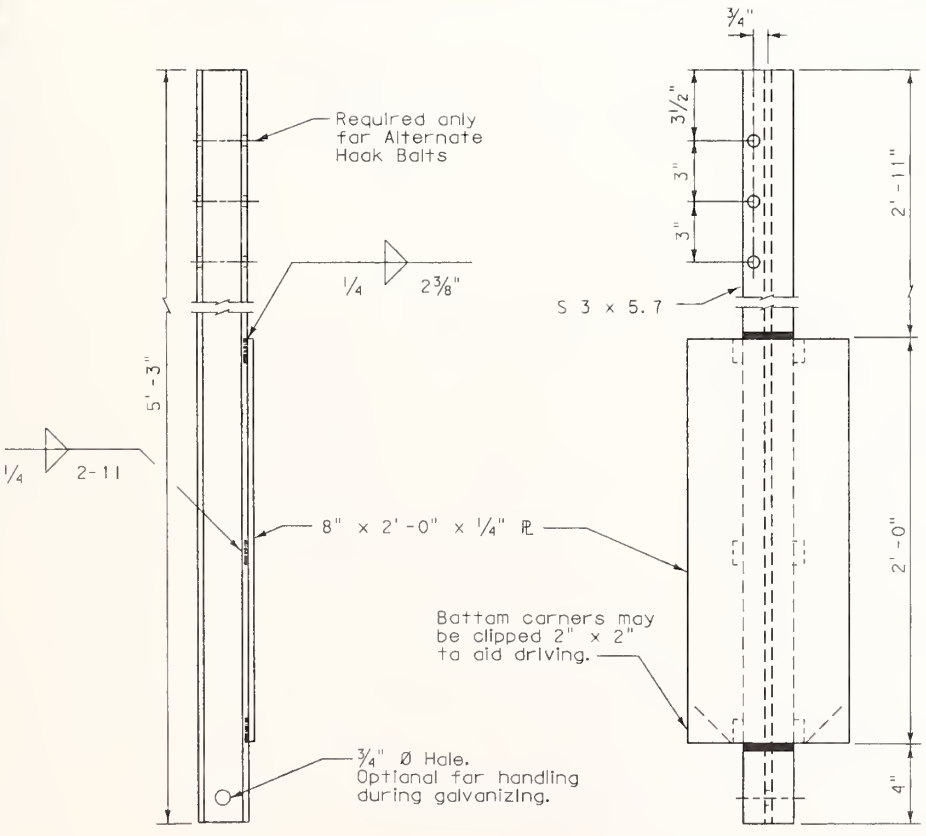
The stud shall conform to the requirements of ASTM A449 and shall be galvanized in accordance with ASTM A153. The threads shall have a Class 2A fit before galvanizing. Prior to galvanizing a 3/8 - inch slot for the locking pin shall be milled into the stud end.

Wire rope shall conform to the requirements of AASHTO M-30 and shall be 3/4- inch preformed, 6 x 19, wire strand core or independant wire rope core (IWRC), galvanized, right regular lay, manufactured of improved plow steel with a minimum breaking strength of 42,800 pounds.

The swaged fitting, stud and nut (F-35-76) shall develope the breaking strength of the wire rope.

CABLE ASSEMBLY

F-37-76



Notes:

All Holes are 3/8" except as noted.

Welding shall conform to the requirements of the current American Welding Society Structural Welding Code, A.W.S. D1.1.

No punching, drilling, cutting or welding will be permitted after galvanizing.

Posts and post plates shall conform to ASTM A36 and shall be galvanized in accordance with ASTM A123.

STRUCTURAL SHAPE LINE POST (STEEL)

P-1-76

STANDARD DRAWING	
REFERENCE STANDARD SPEC. SECTION 606	DWG. NO. 606-86

GUARDRAIL HARDWARE

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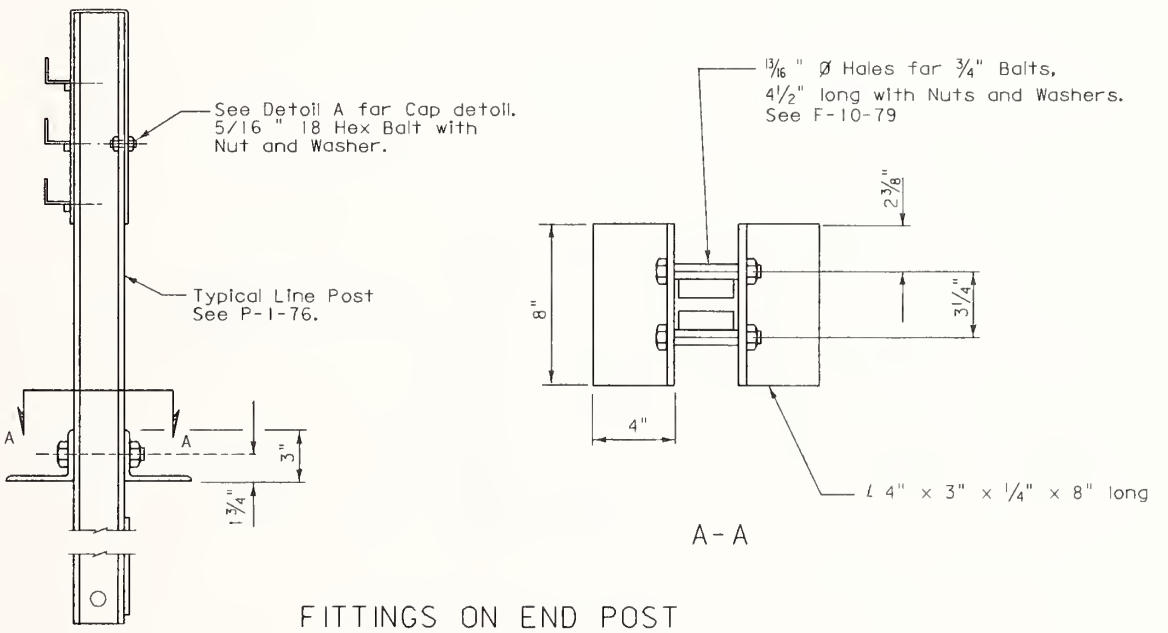
Notes:

Angles and plates shall conform to ASTM A36 and shall be galvanized in accordance with ASTM A123.

Bolts and nuts shall conform to the requirements of ASTM A307 and A563, Grade A or better, respectively: and washers shall be made of steel. Bolts, nuts and washers shall be galvanized in accordance with ASTM A153. Washers shall meet the dimensional requirements of A.N.S.I. B27.2 Type A Narrow Washer.

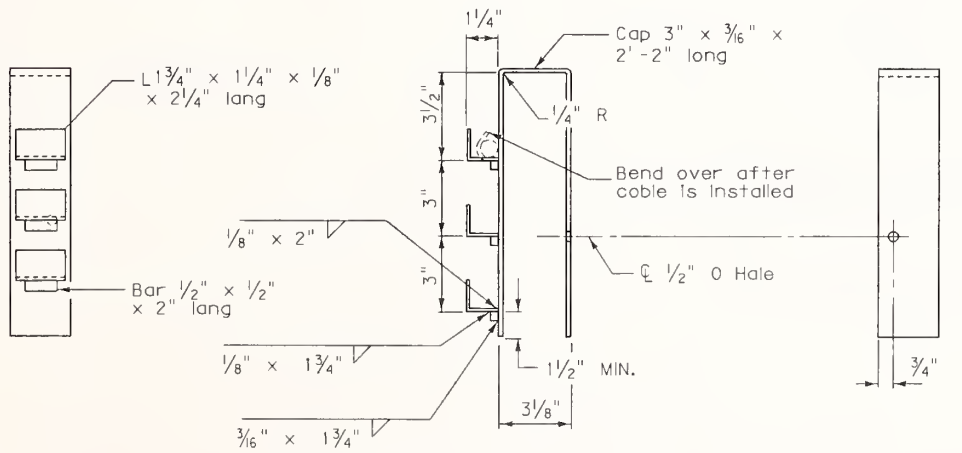
Welding shall conform to the current requirements of the American Welding Society Structural Welding Code, A.W.S. D1.1.

No punching, drilling, cutting of welding will be permitted after galvanizing.


See Detail A for Cap detail.
5/16 " 18 Hex Bolt with Nut and Washer.
Typical Line Post See P-1-76.
A
A
3"
1¾"
13/16 " Ø Holes for ¾" Bolts, 4½" long with Nuts and Washers. See F-10-79
2⅜"
8"
3¼"
4"
L 4" x 3" x ¼" x 8" long

A-A

FITTINGS ON END POST



DETAIL A

END POST FITTINGS

P-2-79

STANDARD DRAWING

REFERENCE	DWG. NO.
STANDARD SPEC. SECTION 606	606-88

GUARDRAIL HARDWARE

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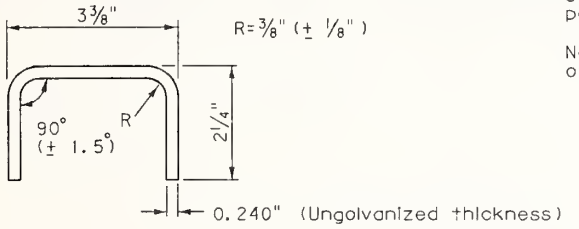
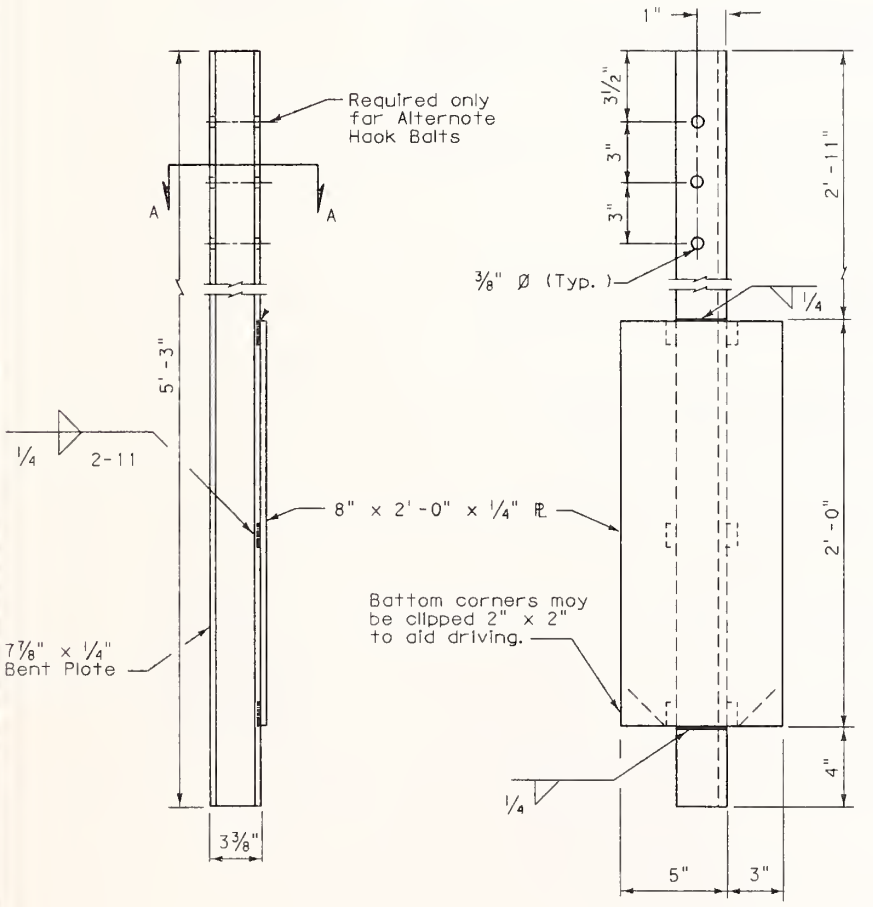
Notes:

Posts and post plates shall conform to the mechanical requirements of ASTM A36 and shall be welded to meet the current requirements of the American Welding Society Structural Welding Code, AWS D1.1. Fabricated posts shall be galvanized in accordance with ASTM A123

No punching, drilling, cutting or welding will be permitted after galvanizing.

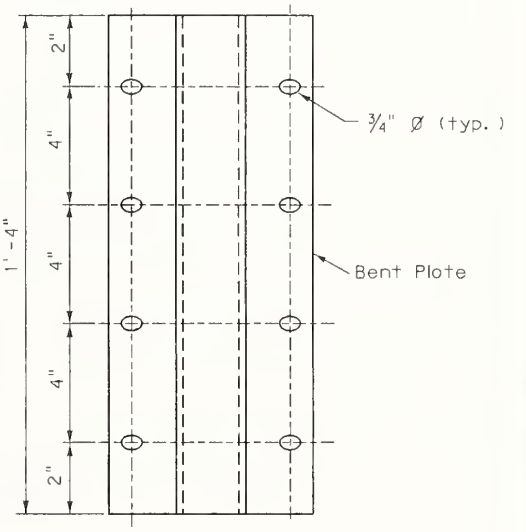


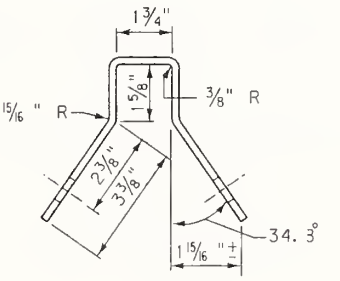
A-A



BENT PLATE LINE POST (STEEL)

P-46 -76





Note:

Anchor Plates shall conform to the requirements of ASTM A36 and shall be galvanized in accordance with ASTM A123.

Note:

No punching, drilling or cutting will be permitted after galvanizing.

BCT ANCHOR PLATE

RE-71 -79

STANDARD DRAWING

REFERENCE STANDARD SPEC. SECTION 606

DWG. NO. 606-90

GUARDRAIL HARDWARE

MONTANA CADD

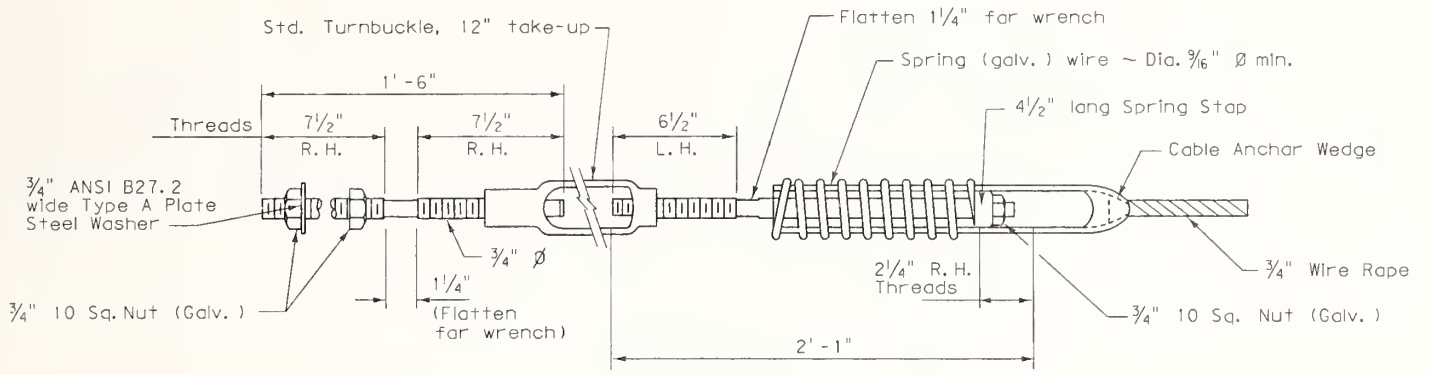
19-MAY-1989 10:16 MTSTD

Z60:[070.001]SD60680.DGN

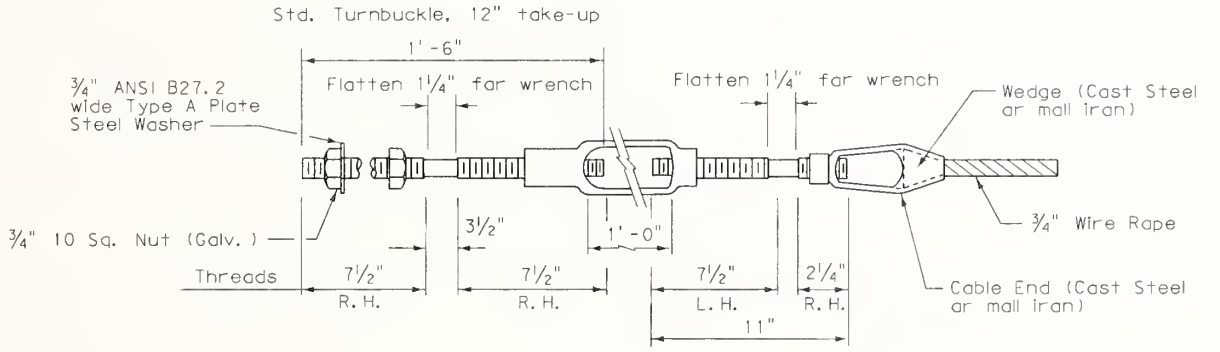
REVISED			
EFFECTIVE	7/1/89		

APPROVED BY Thomas J. Barnard

ADMINISTRATOR-ENGINEERING DIVISION



COMPENSATING CABLE END ASSEMBLY

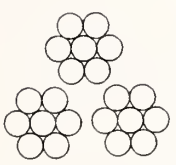


TURNBUCKLE CABLE END ASSEMBLY

Notes:

Wire rope and connecting hardware shall conform to the requirements of AASHTO m-30 Class A ¾- inch rope. Connecting hardware shall develope the full strength of a single cable (25,000 lbs.). Cast steel components shall conform to the requirements of AASHTO M-103 (ASTM A27). Malleable iron castings shall conform to the requirements of AASHTO M-106 (ASTM A47).

At all locations where the cable is connected to a cable socket with a wedge type connection, one wire of the wire rope shall be crimped over the base of the wedge to hold it firmly in place.



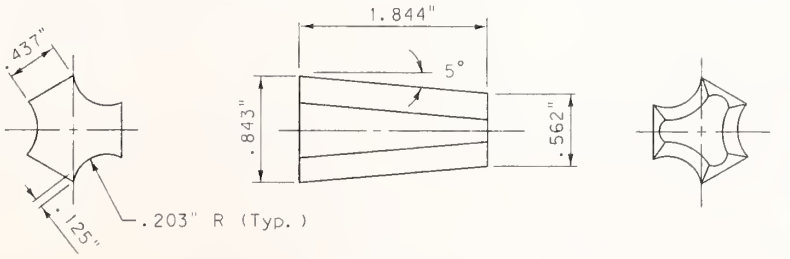
¾" - 3 x 7 WIRE ROPE

Compensating devices shall have spring constants of 450 pounds per inch, plus or minus 50 pounds per inch, and permit a travel of 6 inches plus or minus 1 inch.

Sockets baskets shall be designed for use with the wedge detailed in this standard.

Alternate hardware designs will be considered for approval provided their connection details, for the purpose of maintenance substitutions, are compatible with the details of this standard and their operating characteristics are similar to those of the hardware in this standard.

Threads of externally threaded parts shal be UNC, Class 2A Tolerance (ANSI B1.1). Internally threaded parts shall meet the dimensional requirements of ASTM A563.



WEDGE DETAIL

¾" WIRE ROPE
RE-1-76

STANDARD DRAWING	
REFERENCE STANDARD SPEC. SECTION 606	DWG. NO. 606-92

GUARDRAIL HARDWARE

MONTANA CADD 19-MAY-1989 10:15 MTSTD
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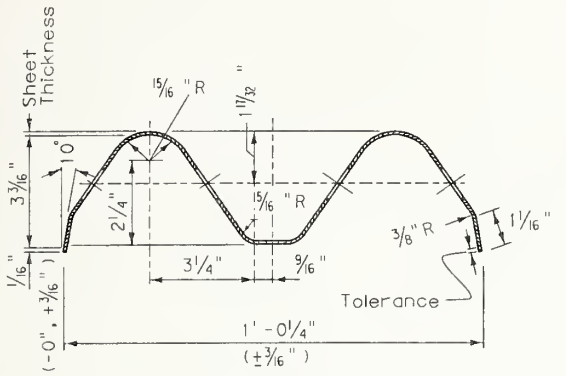
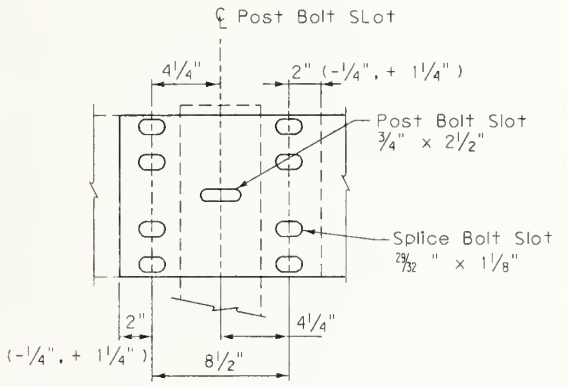
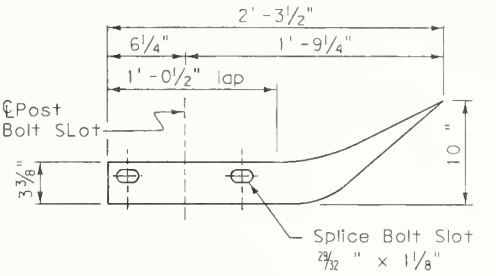
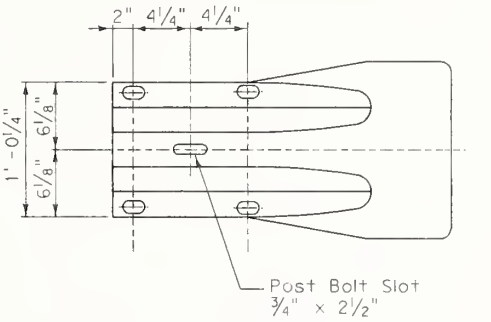
BY Thomas J. Barnard
ADMINISTRATOR-ENGINEERING DIVISION



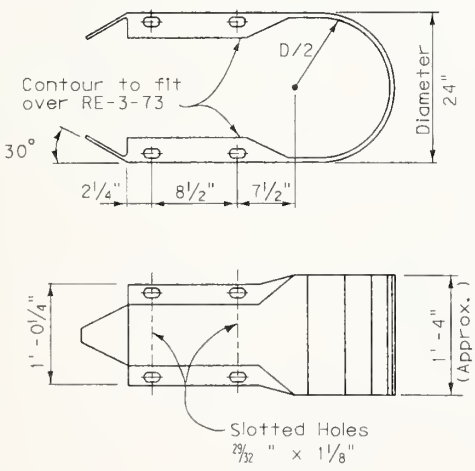


W BEAM
RE-3-73

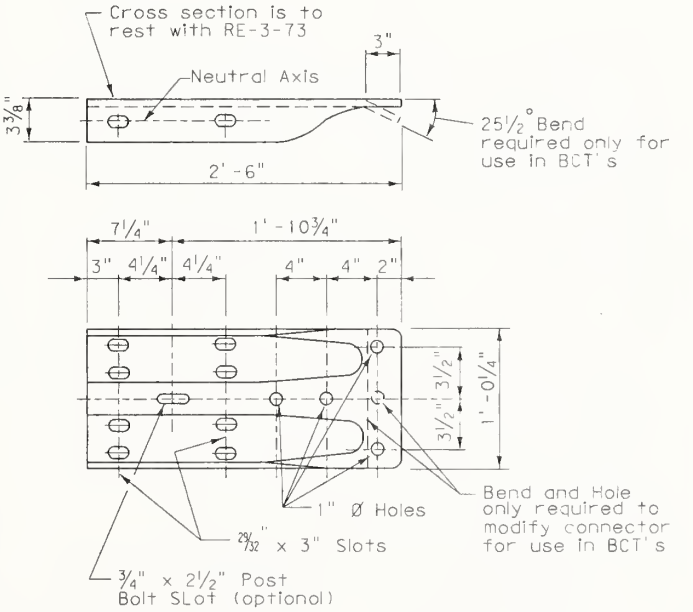




W BEAM END SECTION (FLARED)
RE-5-76



W BEAM END SECTION (BUFFER)
RE-7(24)-79


Cross section is to rest with RE-3-73
3"
Neutral Axis
3 3/8"
25 1/2° Bend required only for use in BCT's
2'-6"
7 1/4"
1'-10 3/4"
3" 4 1/4" 4 1/4"
4" 4" 2"
3 1/2" 3 1/2"
1'-0 1/4"
1" Ø Holes
29/32" x 3" Slots
Bend and Hole only required to modify connector for use in BCT's
3/4" x 2 1/2" Post Bolt SLot (optional)

W BEAM TERMINAL CONNECTOR
RE-8-79

STANDARD DRAWING	
REFERENCE STANDARD SPEC. SECTION 606	DWG. NO. 606-94

GUARDRAIL HARDWARE

MONTANA CADD
19-MAY-1989
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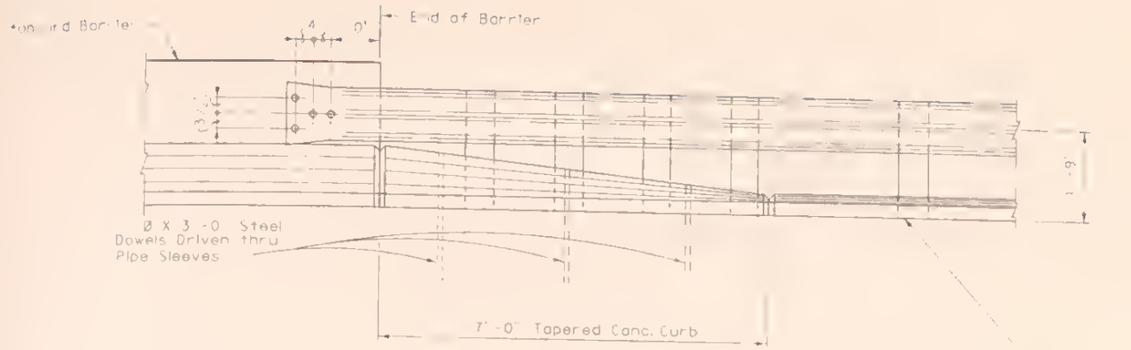
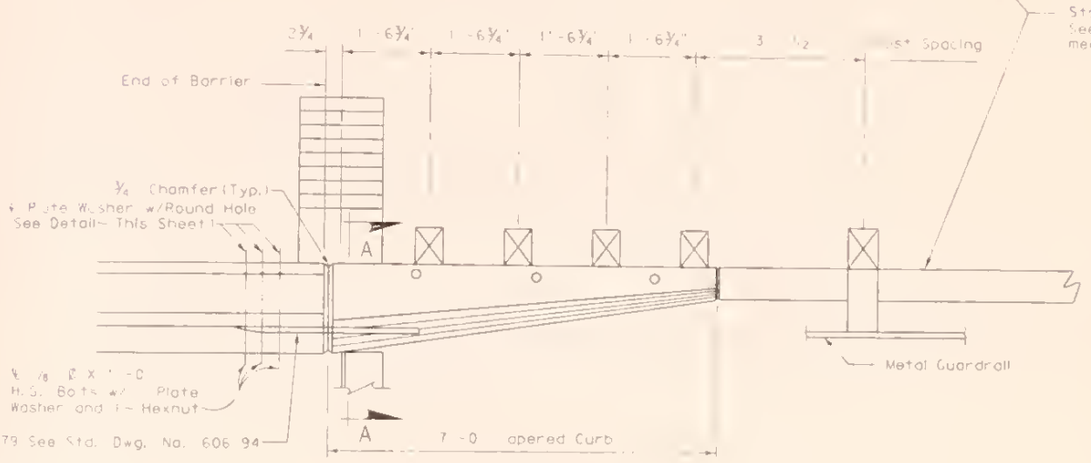
BY Thomas J. Barnard
ADMINISTRATOR-ENGINEERING DIVISION



ELEVATION



PLAN

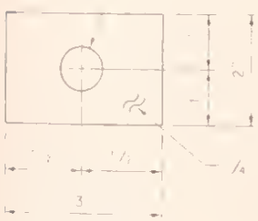
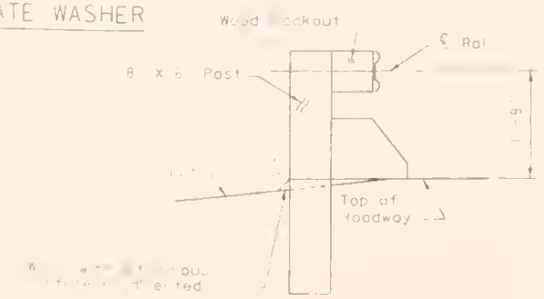


PLATE WASHER

DETAIL "A"



SECTION A-A

NOTES:

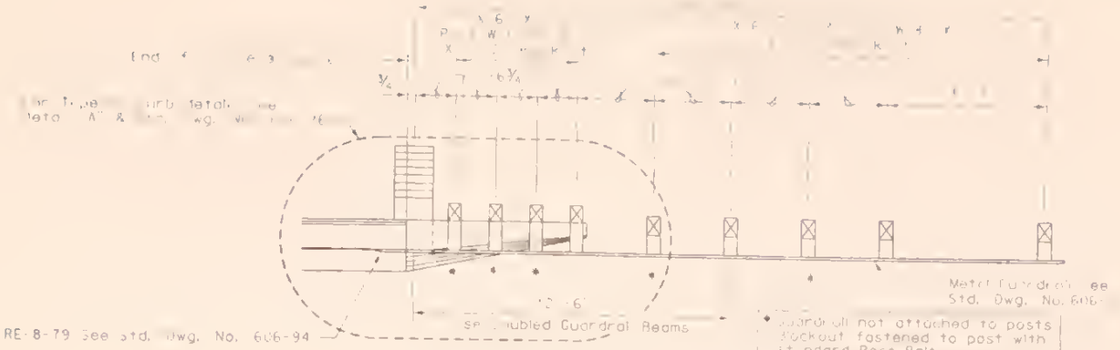
Cost of furnishing and placing RE-8-79, ⅞" Ø Bolts, Plate Washers and Hex Nuts to be included in the unit Price Bid for Bridge Approach section.

Tapered Concrete Curb:
Type 1 See Std. Dwg. No. 606-26
Type 3 See Std. Dwg. No. 606-27

Curb Tapers are not required when existing approach slabs are in place.

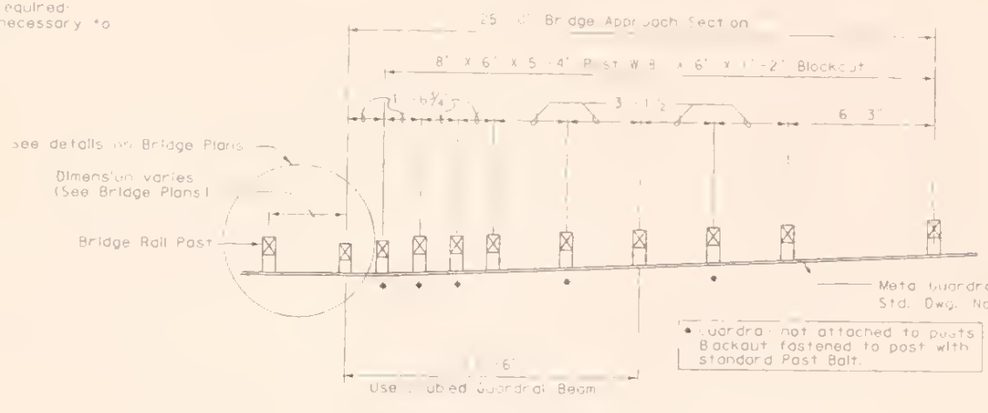
Portions of Guardrail & Blockouts are omitted for clarity

Cost of furnishing and placing curb to be included in the unit price bid for Bridge Approach Section


RE-8-79 See std. Dwg. No. 606-94
Use Doubled Guardrail Beams
Metal Guardrail see Std. Dwg. No. 606-05
Guardrail not attached to posts Blockout fastened to post with Standard Post Bolt.

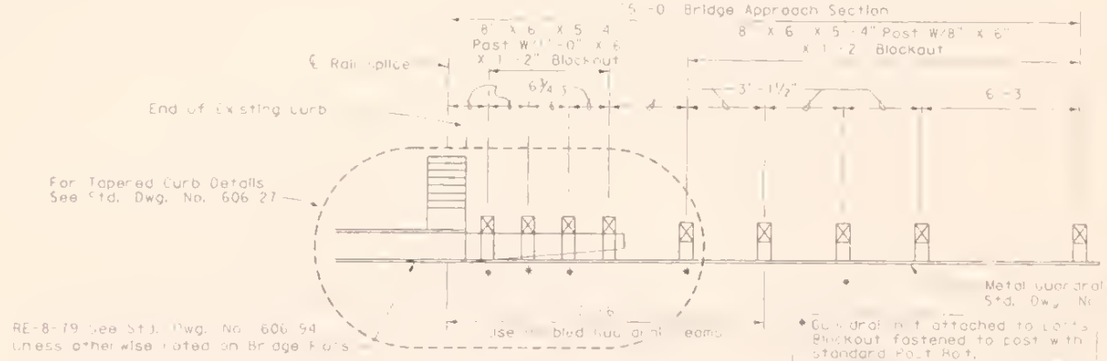
METAL GUARDRAIL-BRIDGE APPROACH SECTION TYPE-1

(For Bridges using Concrete Barrier Rail)


25'-0" Bridge Approach Section
8" X 6" X 5'-4" Post W/8" X 6" X 1'-2" Blockout
3 - 1½
6 3"
see details on Bridge Plans
Dimension varies (See Bridge Plans)
Bridge Rail Post
Metal Guardrail see Std. Dwg. No. 606-05
Guardrail not attached to posts Blockout fastened to post with standard Post Bolt.
Use Doubled Guardrail Beam

METAL GUARDRAIL-BRIDGE APPROACH SECTION TYPE-2

(For Bridges without curbs


25'-0" Bridge Approach Section
8" X 6" X 5'-4" Post W/8'-0" X 6" X 1'-2" Blockout
8" X 6" X 5'-4" Post W/8" X 6" X 1'-2" Blockout
℄ Rail Splice
End of Existing Curb
For Tapered Curb Details See Std. Dwg. No. 606-27
3'-1½"
6¾"
6'-3
RE-8-79 See Std. Dwg. No. 606-94 Unless otherwise noted on Bridge Plans
Use Doubled Guardrail Beams
Metal Guardrail see Std. Dwg. No. 606-05
Guardrail not attached to posts Blockout fastened to post with standard Post Bolt.

METAL GUARDRAIL-BRIDGE APPROACH SECTION TYPE-3

(For Bridges with existing concrete curbs

STANDARD DRAWING

REFERENCE	DWG. NO.
STANDARD SPEC. SECTION 606	606-25

BRIDGE APPROACH SECTIONS

MONTANA CADD 19 MAY 1989 09:33 250-(07d, 00113)606-25_06b

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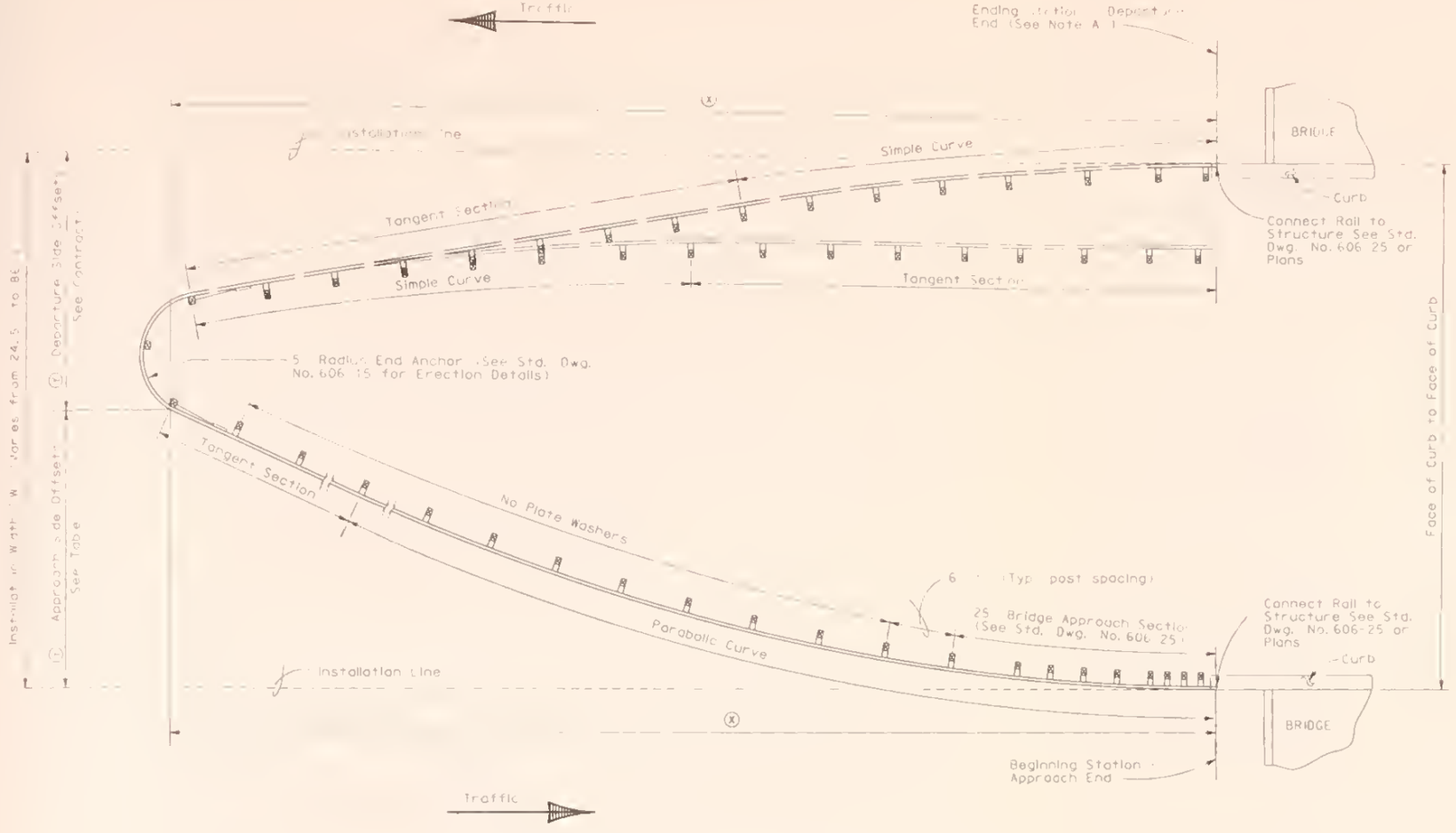

Traffic
Ending Station - Departure End (See Note A)
Installation Line
Simple Curve
Tangent Section
BRIDGE
Curb
Connect Rail to Structure See Std. Dwg. No. 606-25 or Plans
Simple Curve
Tangent Section
5' Radius End Anchor (See Std. Dwg. No. 606-15 for Erection Details)
Face of Curb to Face of Curb
Installation Width W (Varies from 24.5' to 86')
Ⓨ Departure Side Offset See Contract
Ⓧ Approach Side Offset See Table
Tangent Section
No Plate Washers
6' (Typ.) post spacing)
25' Bridge Approach Section (See Std. Dwg. No. 606-25)
Parabolic Curve
Connect Rail to Structure See Std. Dwg. No. 606-25 or Plans
Curb
Installation Line
BRIDGE
Ⓧ
Beginning Station - Approach End
Traffic

GUARDRAIL INSTALLATION FOR MEDIAN HAZARDS

No Scale

APPROACH SIDE DISTANCES & OFFSETS * (TO BEAM FACE			
W**	APPROACH STATION	Ⓧ	Ⓨ
	0.00	0.00	0.00
	1.56	1.56	0.01
	3.13	3.13	0.03
	4.69	4.69	0.07
	6.25	6.25	0.12
	9.38	9.37	0.24
	12.50	12.49	0.43
	15.63	15.61	0.67
	18.75	18.72	0.96
	25.00	24.92	1.71
	31.25	31.10	2.66
	37.50	37.24	3.82
	43.75	43.34	5.17
	50.00	49.40	6.73
	56.25	55.40	8.48
	62.50	61.34	10.41
	68.75	67.22	12.53
35.70	75.00	73.03	14.82
	81.25	78.79	17.28
41.10	87.50	84.46	19.89
	93.75	90.13	22.57
48.70	100.00	95.81	25.14
	106.25	101.48	27.76
	112.50	107.15	30.39
	118.75	112.82	33.01
64.00	125.00	118.49	35.64
	131.25	124.17	38.26
71.60	137.50	129.84	40.89
	143.75	135.51	43.51
79.30	150.00	141.18	46.13
	156.25	146.85	48.76
86.90	162.50	152.53	51.38

Ⓧ Is the distance along the installation line from the beginning or ending station to a post location.

Ⓨ Is the distance from installation line to Beam face.

* For tangent sections of roadway only. See plans for distances and offsets for installations on curves.

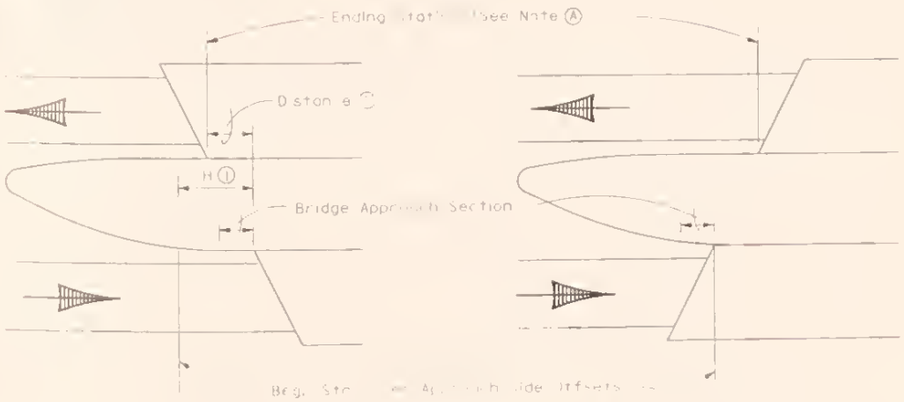
** Installation widths at which approach stations are terminated and departure side data from contract are initiated.

NOTES

Ⓐ Total length of guardrail required per installation is adjusted upward on the Plan Summary Sheet to the nearest multiple of 12.5 feet.

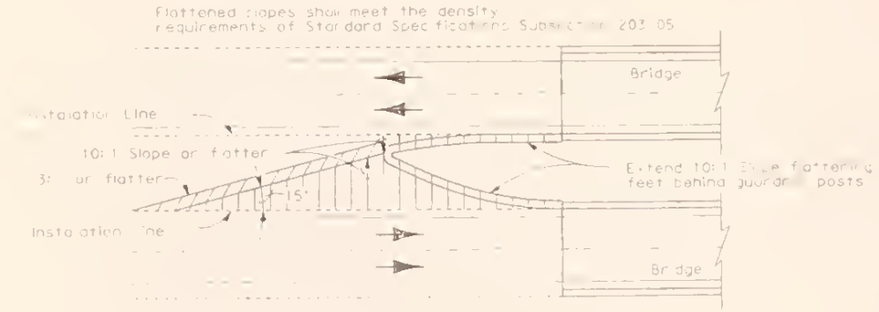
See plans for Drainage Details

NOTE: [illegible] the nearest multiple of [illegible] which does not exceed Distance Ⓘ.



SKEWED BRIDGE DETAILS

No Scale


Flattened slopes shall meet the density requirements of Standard Specifications Subsection 203.05
Bridge
Installation Line
10:1 Slope or flatter
3:1 or flatter
Extend 10:1 Slope flattening [illegible] feet behind guardrail posts
Installation Line
Bridge

SLOPE FLATTENING DETAIL

No Scale

STANDARD DRAWING	
REFERENCE STANDARD SPEC. SECTION 606	DWG. NO. 606-30

GUARDRAIL INSTALLATION FOR MEDIAN HAZARDS

APPROVED

BY [signature]

ADMINISTRATOR-ENGINEERING DIVISION

MONTANA CADD 19 MAY 1989 11:23 MTSTD

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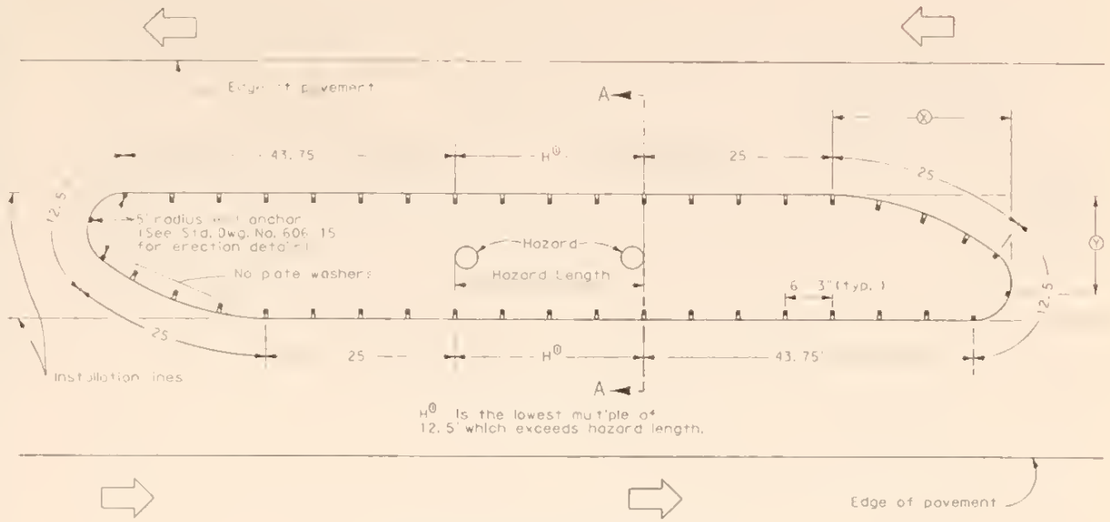
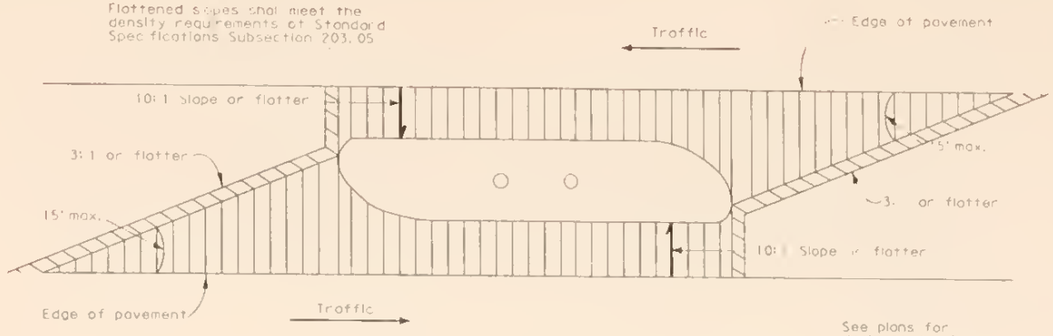
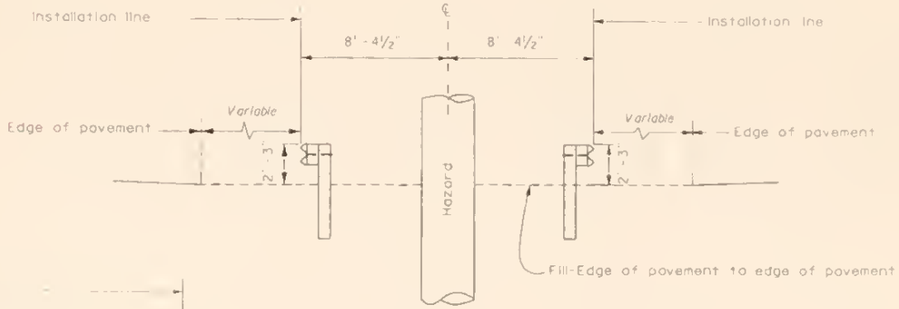


MEDIAN HAZARD TREATMENT

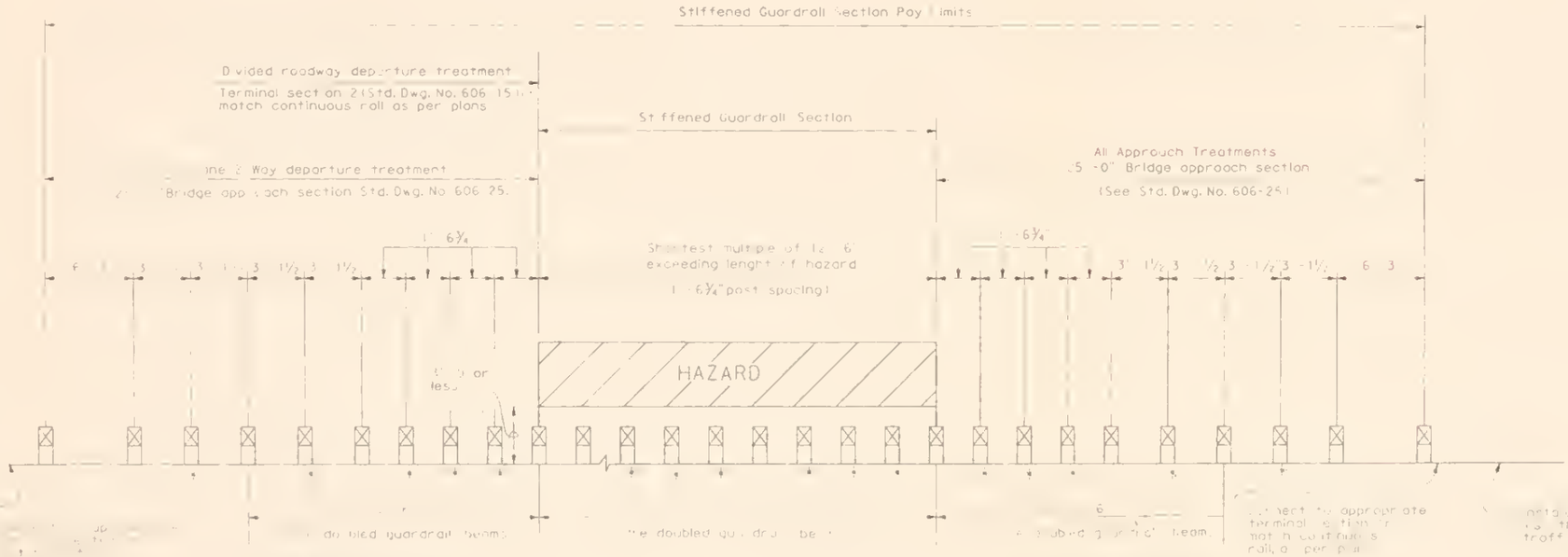
For median widths 16'-9" and greater



SLOPE FLATTENING DETAIL



SECTION A-A


Stiffened Guardrail Section Pay Limits
Divided roadway departure treatment
Terminal section (Std. Dwg. No. 606-15) to match continuous rail as per plans
Stiffened Guardrail Section
All Approach Treatments
25'-0" Bridge approach section
(See Std. Dwg. No. 606-25)
One Way departure treatment
Bridge approach section Std. Dwg. No. 606-25
1'-6¾"
Shortest multiple of 12'-6" exceeding lenght of hazard
(1'-6¾" post spacing)
HAZARD
8'-0" or less
Divided guardrail beam
Double guardrail beam
Subdivided guardrail beam
Note: All post and offset blocks are to be of the same length as per the applicable Std. Dwg. No.

STIFFENED GUARDRAIL SECTION

(For use when hazard width is greater than 8'-0" and less than 16'-9")

*INSTALLATION LINE DISTANCES AND OFFSETS TO BEAM FACE			
	DISTANCE ALONG CURVE	Ⓧ	Ⓨ
PC	0	0	0
	6.25	6.24	0.50
	12.50	12.29	1.99
	18.75	18.03	4.42
PCC	25.00	23.32	7.75
	31.25	25.07	13.33
PT	37.50	20.33	16.75

Ⓧ is the distance along the installation line from the beginning of parabola to a post location

Ⓨ is the offset from installation line to Beam face

*For tangent sections of roadway only see plans for distances and offsets for installations on curves

INSTALLATION DISTANCES AND OFFSETS*

STANDARD DRAWING	
REFERENCE STANDARD SPEC. SECTION 606	DWG. NO. 606-35

SPECIAL HAZARD TREATMENTS

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